Lane Repurposing Workshop (Part 2)

1:30 – 3:00 pm ET

When? & How?

November 6, 2020 Session for:

PALM BEACH Transportation Planning Agency

When?

Table 1. Problems Potentially Correctable by Road Diet Implementation

Category	Problem	Rationale
Safety	Rear-end crashes with left-turning traffic due to speed discrepancies	Removing stopped vehicles attempting to turn left from the through lane could reduce rear-end crashes
	Sideswipe crashes due to lane changes	Eliminating the need to change lanes reduces sideswipe crashes
	Left-turn crashes due to negative offset left turns from the inside lanes	Eliminating the negative offset between opposing left-turn vehicles and increasing available sight distance can reduce left-turn crashes
	Bicycle and pedestrian crashes	Bicycle lanes separate bicycles from traffic; pedestrians have fewer lanes to cross and can use a refuge area, if provided
Operational	Delays associated with left-turning traffic	Separating left-turning traffic has been shown to reduce delays at signalized intersections
	Side street delays at unsignalized intersections	Side-street traffic requires shorter gaps to complete movements due to the consolidation of left turns into one lane
	Bicycle operational delay due to shared lane with vehicles or sidewalk use	Potential for including a bike lane eliminates such delays
Other	Bicycle and pedestrian accommodation due to lack of facilities	Opportunity to provide appropriate or required facilities, increasing accessibility to non-motorized users
	Unattractive aesthetic	Provisions can be made for traversable medians and other treatments
	Vehicles speeds discourage pedestrian activity	Potential for more uniform speeds; opportunity to encourage pedestrian activity

Adapted from Kentucky Transportation Center's Guidelines for Road Diet Conversions[3]

Think "Purpose and Need"

When? - Location Screening

GCMPC
GENESEE COUNTY METROPOLITAN PLANNING COMMISSION

- GCMPC assessed more than 140 miles of four-lane undivided road in its jurisdiction for potential conversion to three lanes.
- Allows opportunity to consider conversions as part of future resurfacing projects

Candidate Screening Techniques

Complete Streets 4 to 3 Lane Conversion Study

12th Street / S. Ballenger Hwy

From: Miller Rd
To: Grand Traverse St
Number of Signals: 6
Driveways and Side Streets: Few
Land Use: School, Residential, Industrial
Left Turn Lane: Miller, Van Slyke, Grand Traverse
Speed Limit: 30-45
Width Inside Lane: 11
Width Outside Lane: 12
Total Width: 46
Bus Route: No
High ADT: 11710
Low ADT: 4305

2008-2013 Crash Data

Rear End Crashes: 48
Read End – Left Turn Crashes: 2
Head On – Left Turn Crashes: 28
Side-Swipe Crashes: 27
Total All Crash Types: 223
Crashes per mile per year: 11.26

Recommendations ★★★

This is a good candidate for a road diet. The corridor has a high crash rate and narrow widths. ADT is low and capacity issues should not be a problem. Around the curve at S. Ballenger Hwy is an area with a lot of crashes, having the lanes reconfigured as a 3-lane with a center-turn lane will provide a buffer between the two directions of traffic and help with limiting head-on collisions and side-swipes. Adding a bike lane will provide a connection to the Grand Traverse Greenway Trail which crosses 12th Street between Fenton and Grand Traverse and a connection to Southwestern Academy.

This is a good candidate for a road diet.

The corridor has a high crash rate and narrow widths.

ADT is low and capacity issues should not be a problem.

Around the curve at S. Ballenger Hwy is an area with a lot of crashes, having the lanes reconfigured as a 3-lane with a center-turn lane will provide a buffer between the two directions of traffic and help with limiting head-on collisions and side-swipes.

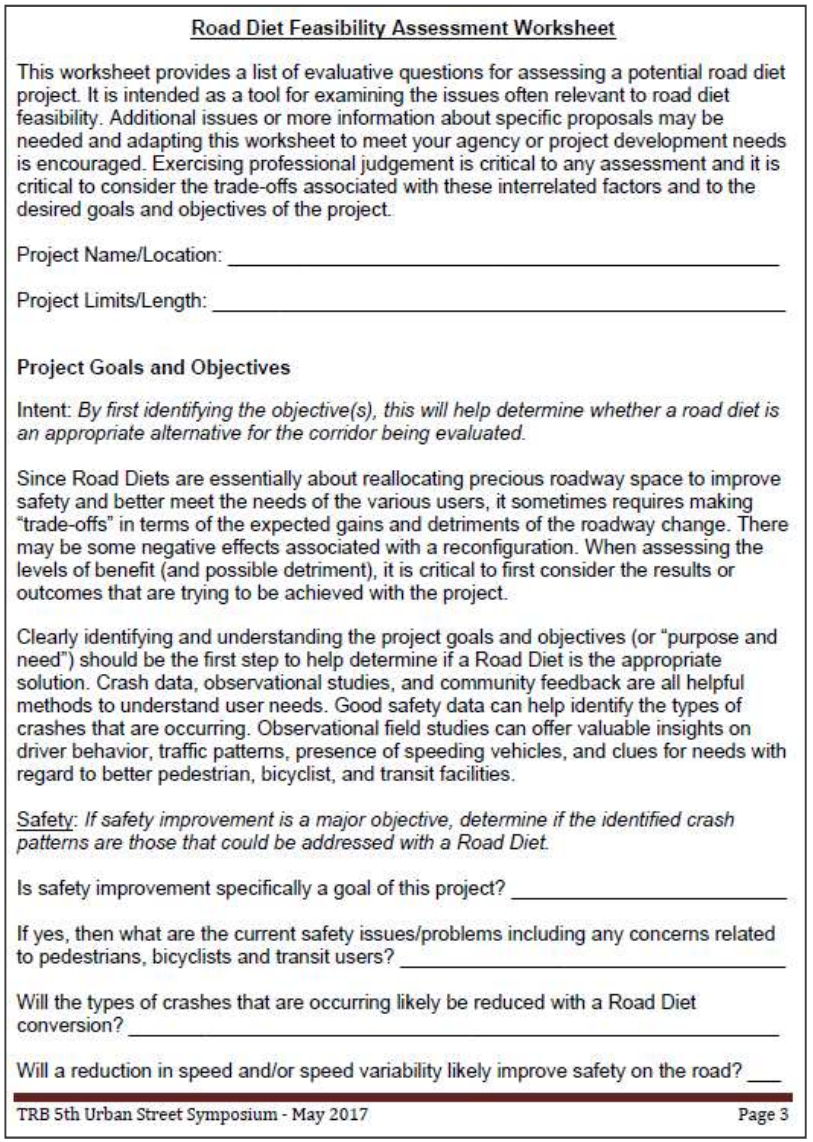
Adding a bike lane will provide a connection to the Grand Traverse Greenway Trail which crosses 12th Street between Fenton and Grand Traverse and a connection to Southwestern Academy

Feasibility Considerations

Evaluative Factors

Resources

Worksheet from FHWA Road Diet Workshop



Road Diet Feasibility Assessment Worksheet

This worksheet provides a list of evaluative questions for assessing a potential road diet project. It is intended as a tool for examining the issues often relevant to road diet feasibility. Additional issues or more information about specific proposals may be needed and adapting this worksheet to meet your agency or project development needs is encouraged. Exercising professional judgement is critical to any assessment and it is critical to consider the trade-offs associated with these interrelated factors and to the desired goals and objectives of the project.

Project Name/Location: _____

Project Limits/Length: _____

Project Goals and Objectives

Intent: *By first identifying the objective(s), this will help determine whether a road diet is an appropriate alternative for the corridor being evaluated.*

Since Road Diets are essentially about reallocating precious roadway space to improve safety and better meet the needs of the various users, it sometimes requires making "trade-offs" in terms of the expected gains and detriments of the roadway change. There may be some negative effects associated with a reconfiguration. When assessing the levels of benefit (and possible detriment), it is critical to first consider the results or outcomes that are trying to be achieved with the project.

Clearly identifying and understanding the project goals and objectives (or "purpose and need") should be the first step to help determine if a Road Diet is the appropriate solution. Crash data, observational studies, and community feedback are all helpful methods to understand user needs. Good safety data can help identify the types of crashes that are occurring. Observational field studies can offer valuable insights on driver behavior, traffic patterns, presence of speeding vehicles, and clues for needs with regard to better pedestrian, bicyclist, and transit facilities.

Safety: *If safety improvement is a major objective, determine if the identified crash patterns are those that could be addressed with a Road Diet.*

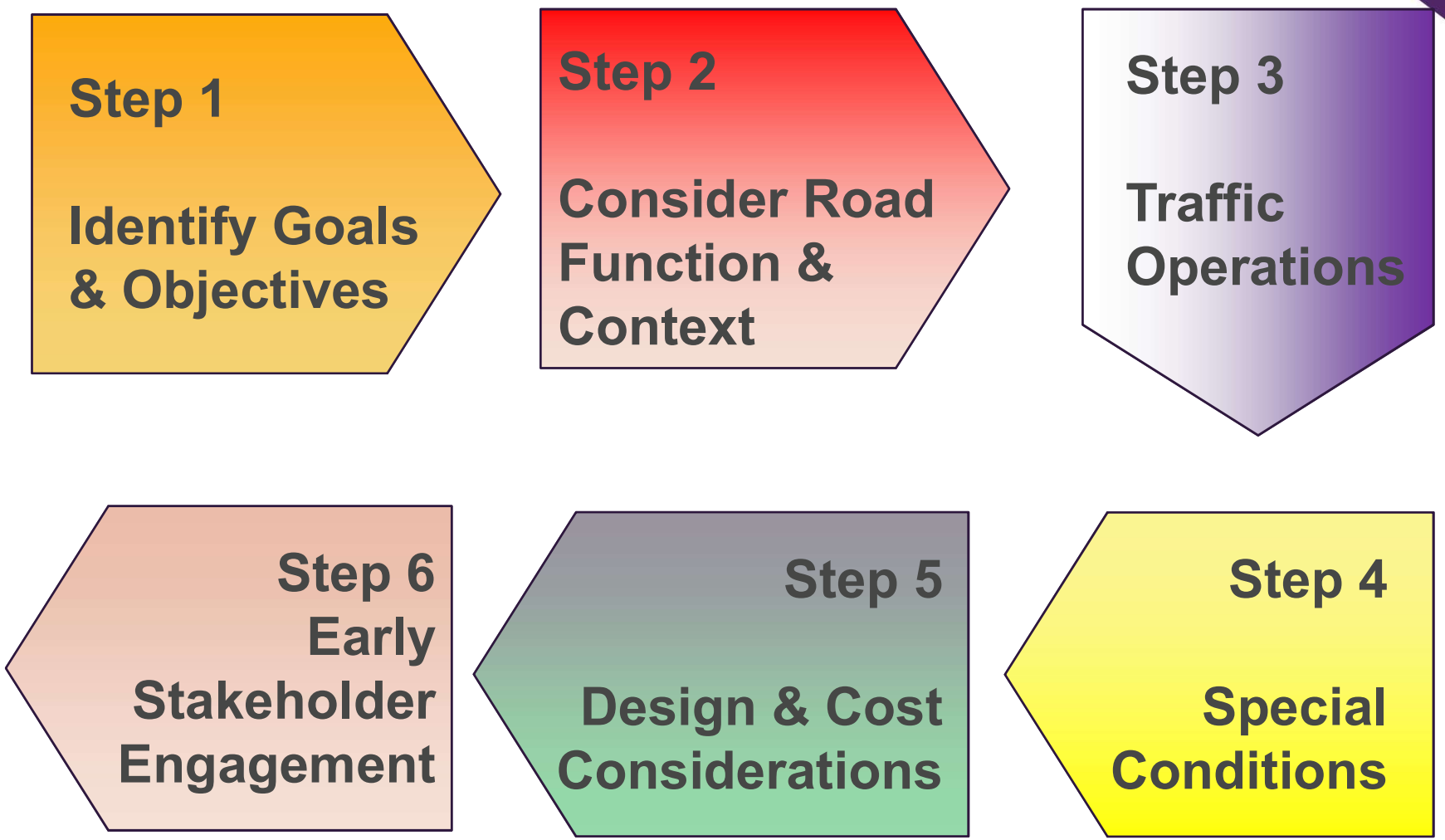
Is safety improvement specifically a goal of this project? _____

If yes, then what are the current safety issues/problems including any concerns related to pedestrians, bicyclists and transit users? _____

Will the types of crashes that are occurring likely be reduced with a Road Diet conversion? _____

Will a reduction in speed and/or speed variability likely improve safety on the road? ___

Feasibility Worksheet Steps



Feasibility Worksheet Steps

Project Goals & Objectives

- Understanding the project goals and objectives (along with their relative importance) is critical for evaluating the trade-offs that are often inevitable when reallocating valuable road space

Feasibility Assessment

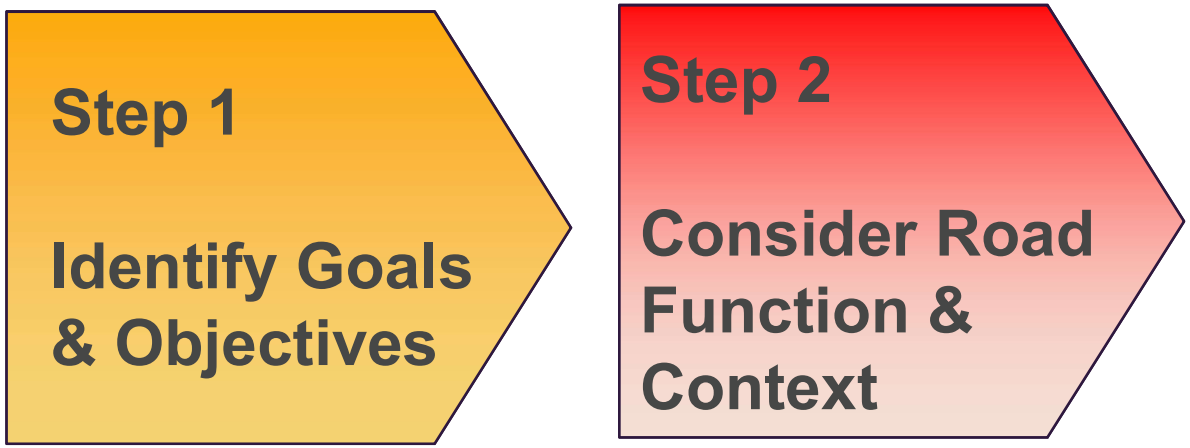
Develop configuration alternatives that meet goals and objectives

Can the desired cross-sectional elements be implemented within the available width?

NO

Can additional ROW be acquired?

Feasibility Worksheet Steps



Functional Classification

- Functional classification historically emerged as the predominant method for grouping streets and highways by their “character of service” and has been an important planning tool

Functional classification categories are related to “hierarchies of travel movements”

The functional classification category may not indicate the actual *context* of the roadway or match its *intended* or *designed* functions

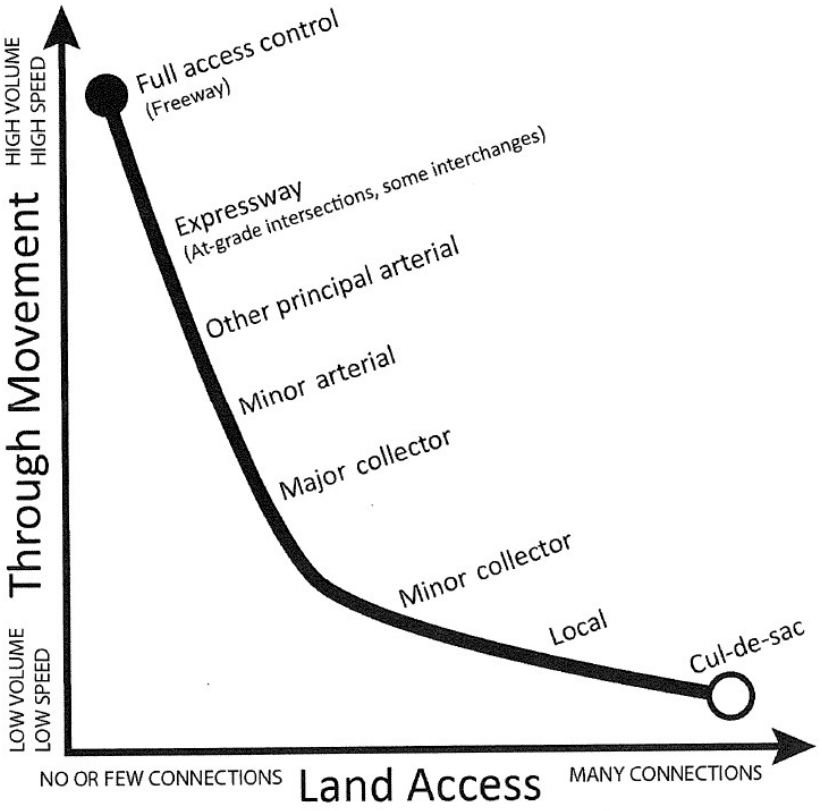
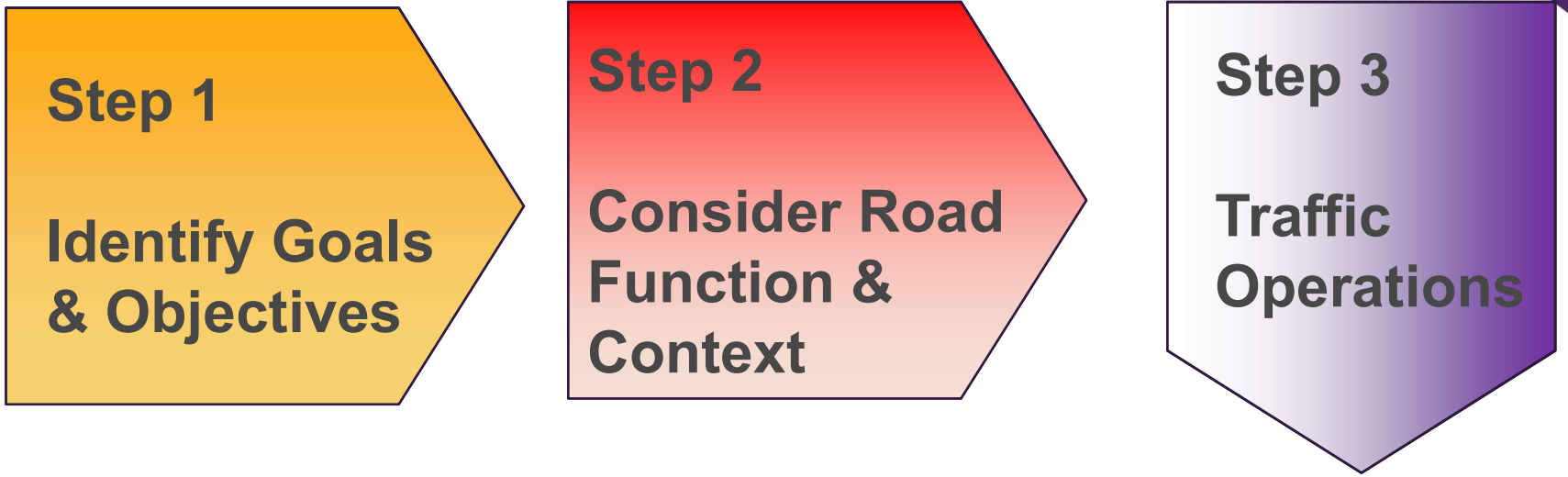


Figure Source: TRB Access Management Manual Second Edition

Potential Functions

- What is the level of freight operation?
  - Is this a designated Truck Route?
- Is this an Emergency Evacuation Route?
- Is this a heavy transit corridor?
- Along the route, are there any:
  - Hospitals?
  - Fire stations?
  - Schools?
  - Major event trip generators?
- Is the adjacent land use expected to remain relatively stable?

Feasibility Worksheet Steps



Traffic Operations

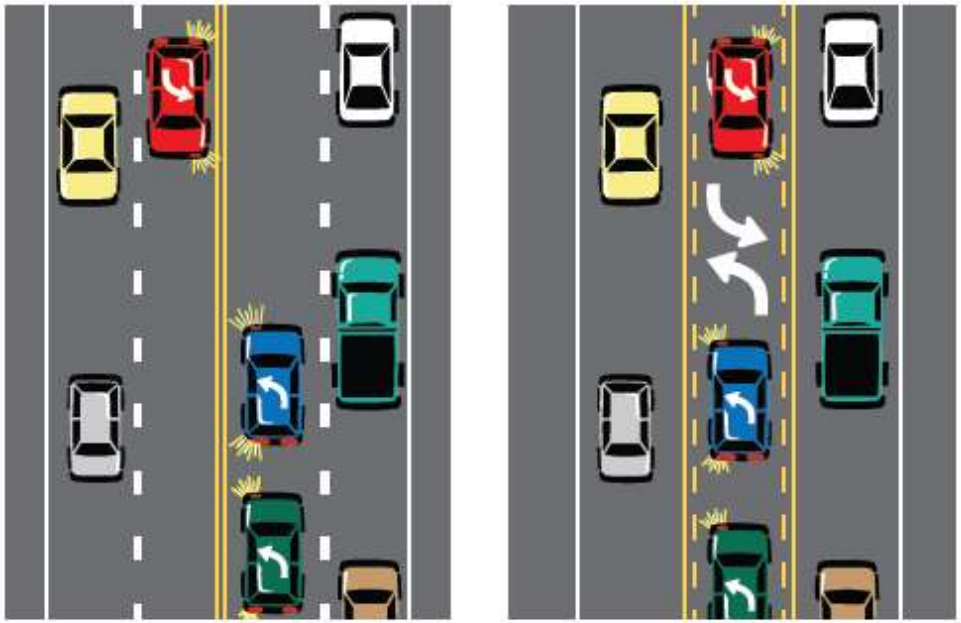
- ADT Volumes
- Peak Hour Volumes
- Transit Operations
- Mid-block Turning Patterns
- Vehicle Speeds
- On-street Parking
- Freight Delivery
- Slow Moving Vehicles
- At-grade RR Crossings

- Intersection Operations

Operational Considerations

A four-lane roadway may already operate like a three-lane road.

Some four-lane undivided roads operate essentially like a three-lane road (defacto one lane in each direction)



Before
A four-lane undivided road operating as a de facto three-lane cross section.

After
A Road Diet providing a two-way left-turn lane.

When a corridor contains a large number of access points (driveways) the majority of through traffic will tend to utilize the outside lanes to avoid being delayed by left-turning vehicles slowing and stopping in the inside lanes.

Operational Considerations

How many lanes are on the adjacent roadway segments?

Adding lanes onto road segments that don't have increased volumes and then reducing lanes downstream can create "bottlenecks" that lead to worse operations than having a consistent number of lanes.

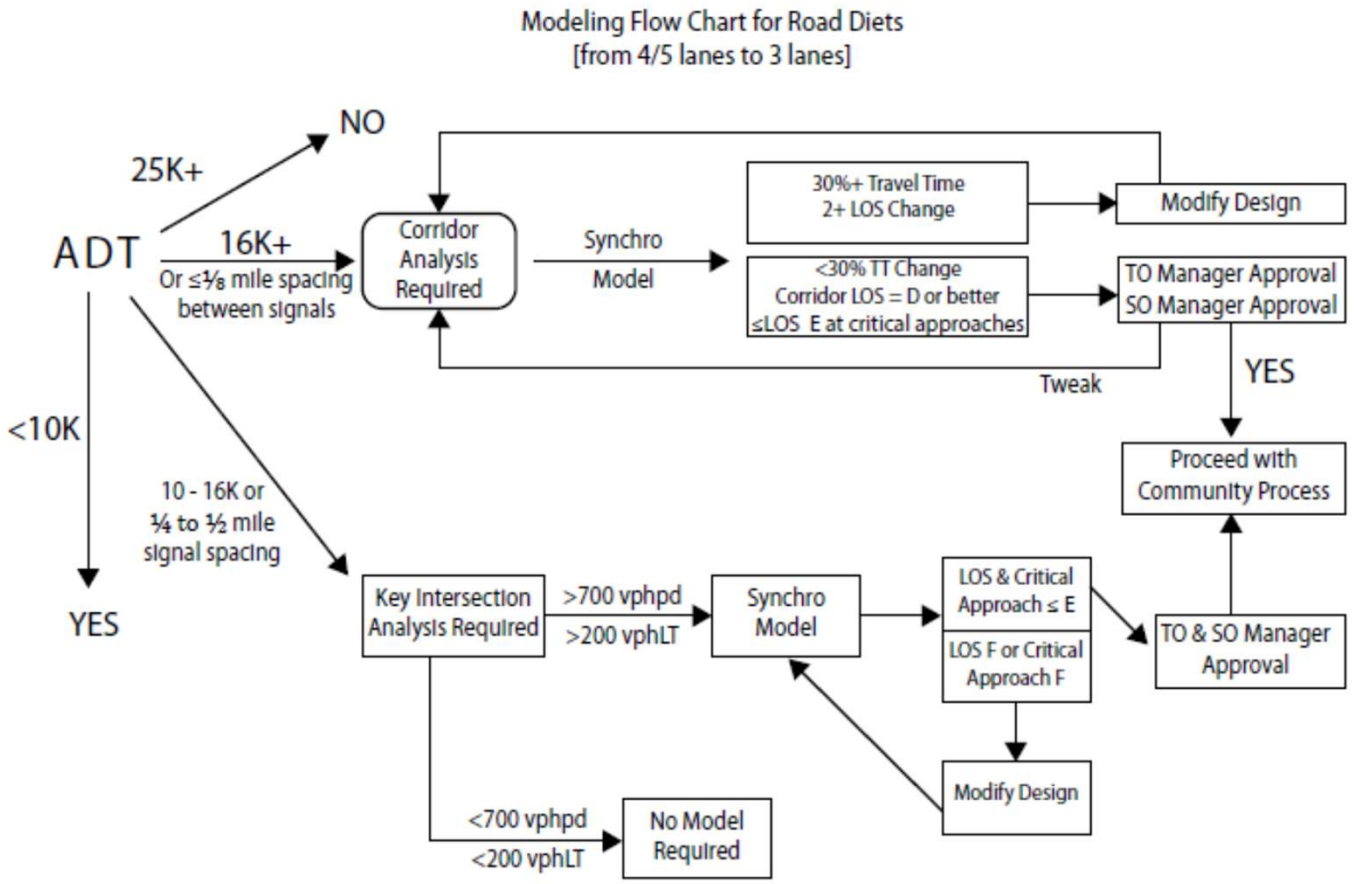
Plumbing Analogy: Where is the clog likely to occur?

General Guidelines for 4-Lane

LESS THAN 10,000 ADT	10,000 – 15,000 ADT	15,000 – 20,000 ADT	GREATER THAN 20,000 ADT
Great candidate for Road Diet	Very good candidate for Road Diet	Good candidate for Road Diet	Potential candidate for Road Diet
In most instances traffic will likely not be negatively affected.	Agencies should conduct intersection analysis to study potential traffic operational effects and consider signal retiming as needed.	Agencies should conduct a corridor analysis since traffic operations may be affected at this volume depending on the "before" condition.	Agencies should complete a feasibility study to determine whether this is a good location for a Road Diet. Operations may be affected at this volume.

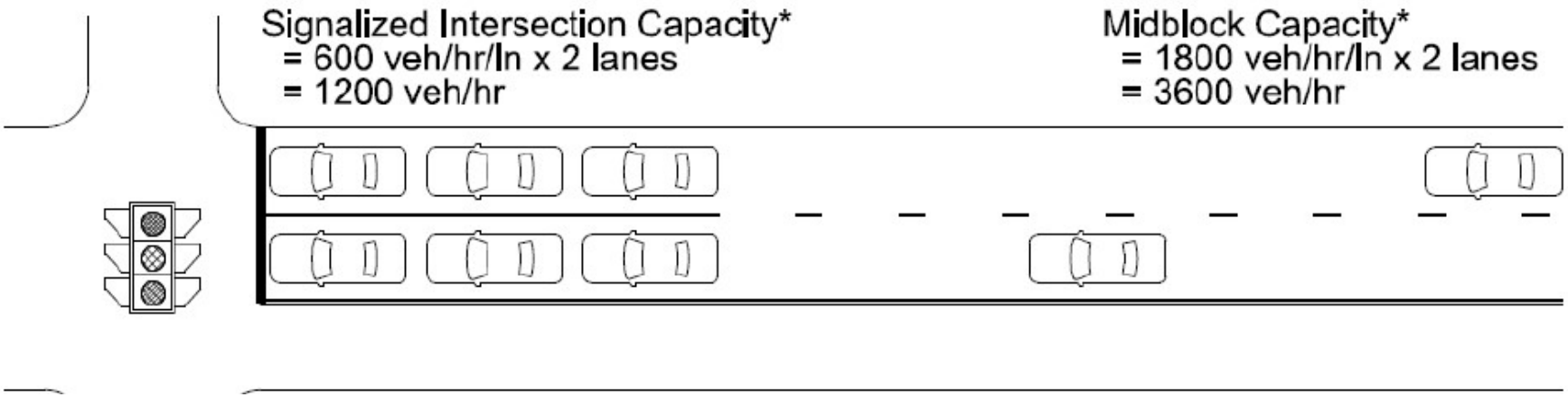
There are examples across the country where Road Diets have been successful with ADTs as high as 26,000.

Volume Based Screening Technique



Seattle Department of Transportation

Intersection Operations

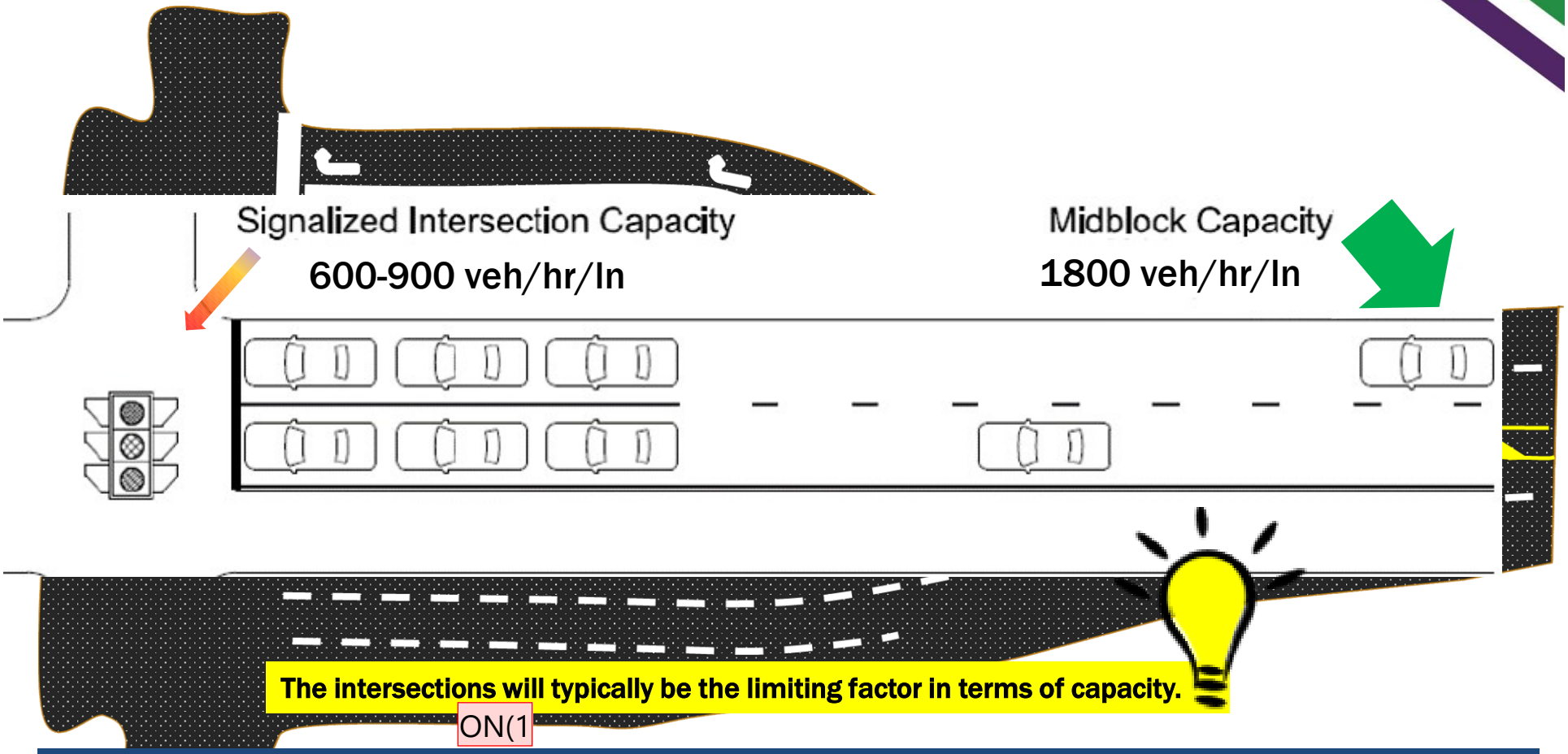


- The “capacity” of a street is determined by the operations at its signalized intersections (or stop-controlled).

- Capacity “rules of thumb”
  - single mid-block travel lane : 1,800 vehicles per hour
  - single travel lane through a signalized intersection: 600 vehicles per hour (dependent on the time allocated in the signal cycle)

Unless the intersection has 2-3x as many lanes as at mid-block, the intersections will be the capacity limiting factor.

Road Diets and Capacity



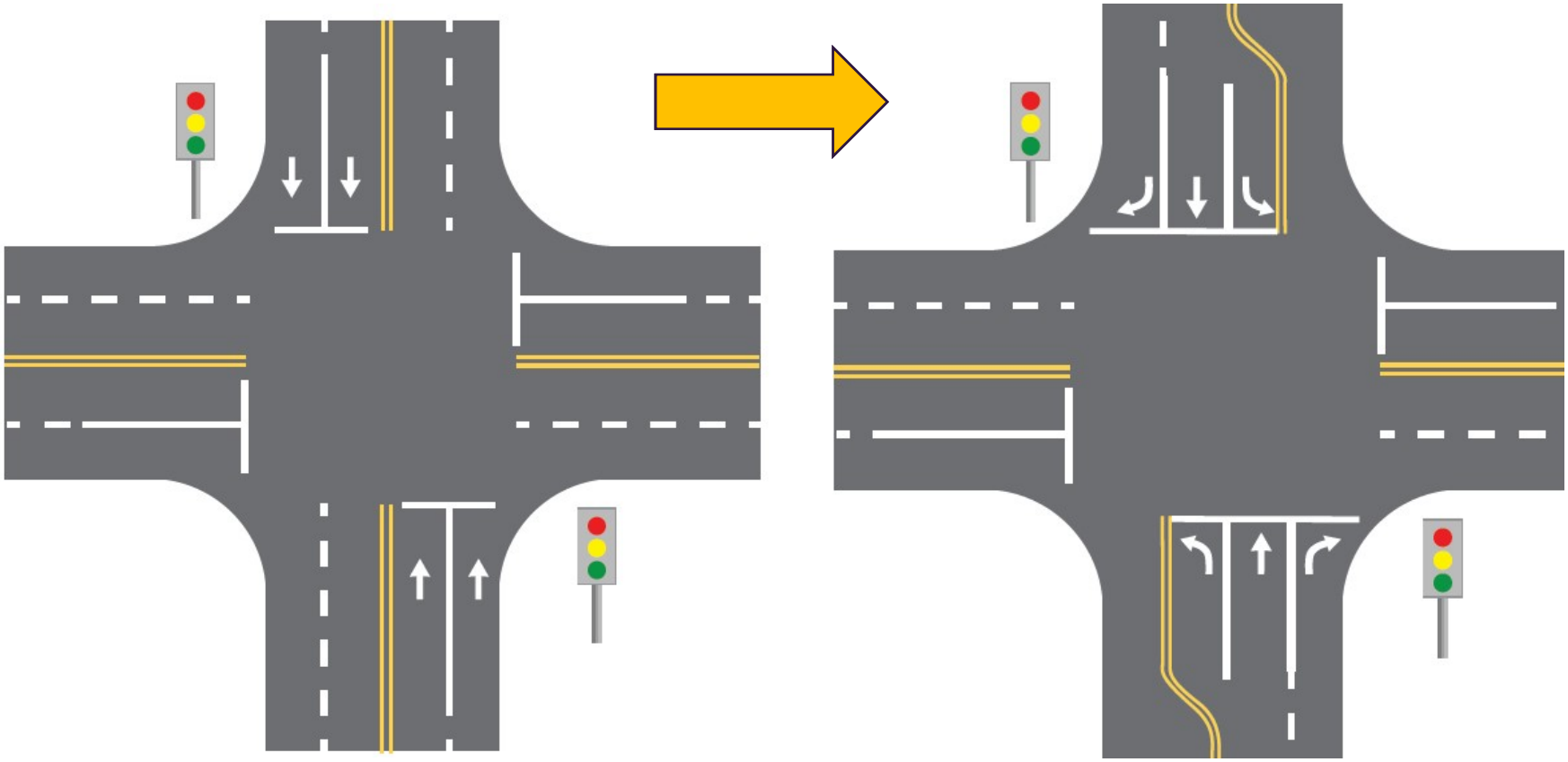
INTERSECTIONS ARE THE OPERATIONAL & CAPACITY CHOKEPOINTS

Slide 21

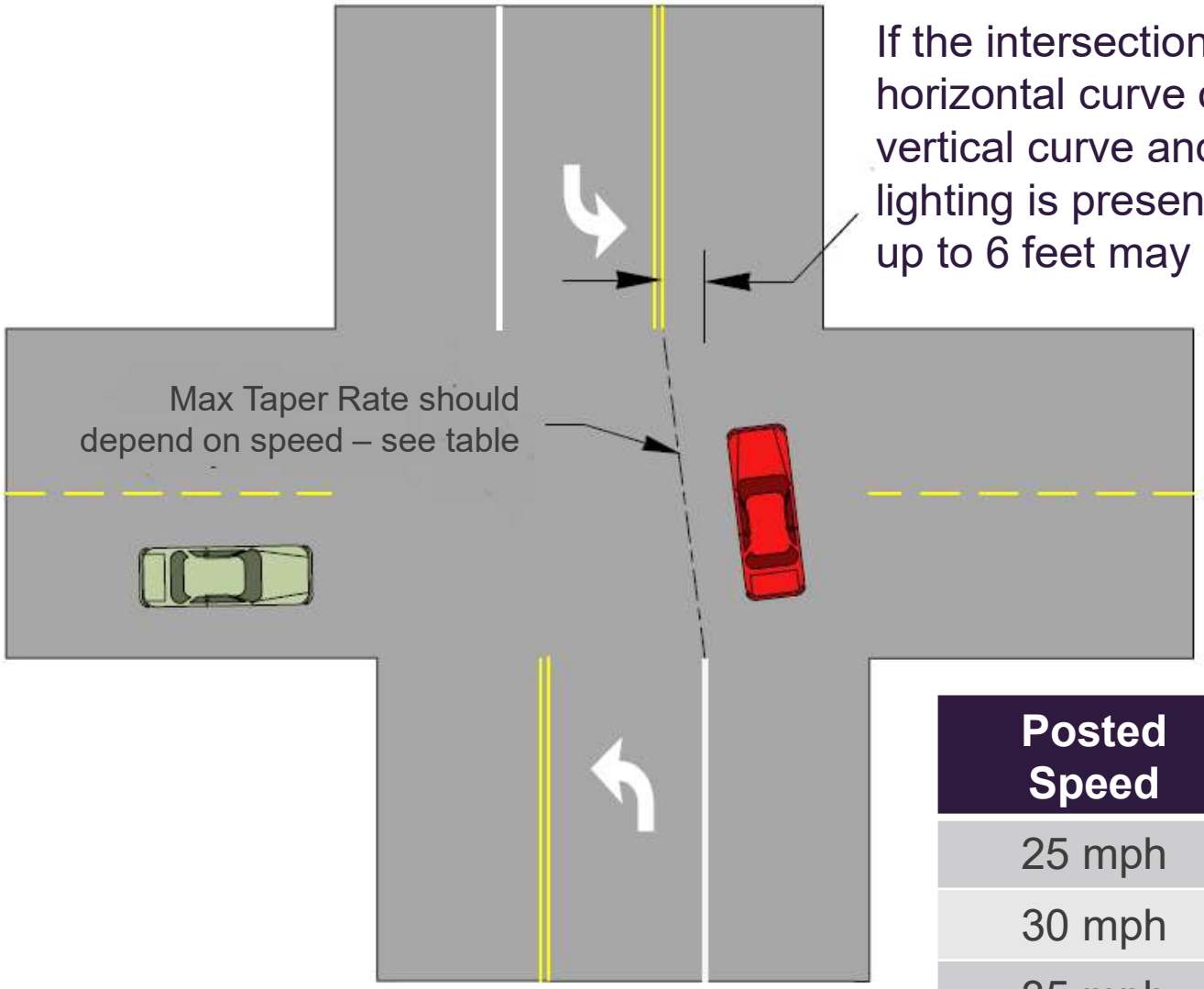
ON(1 text could be a little bit bigger font
Ocel, Norah (FHWA), 4/30/2018

Turn Lane Reallocation

Lane reconfigurations may make it possible to install dedicated turn lanes at the intersections



Offset Lane Alignment



If the intersection is not within a horizontal curve or on a crest vertical curve and intersection lighting is present – lane offsets of up to 6 feet may be acceptable

Posted Speed	Maximum Taper Rate
25 mph	10:1
30 mph	15:1
35 mph	20:1

Traffic Signalization

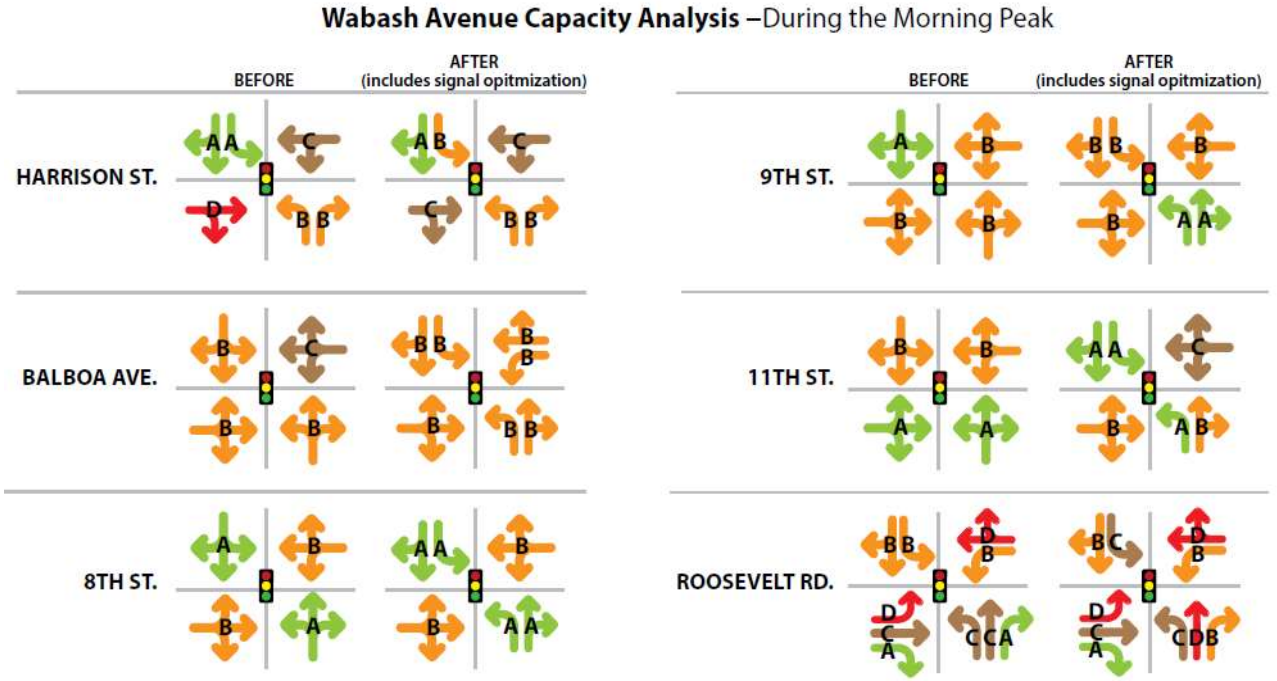
Re-evaluate:

- Traffic signal phasing and timing
  - Mainline traffic may need additional green time
- Type and number of lanes on intersection approaches
  - Turn lane needs
- Signal head positioning

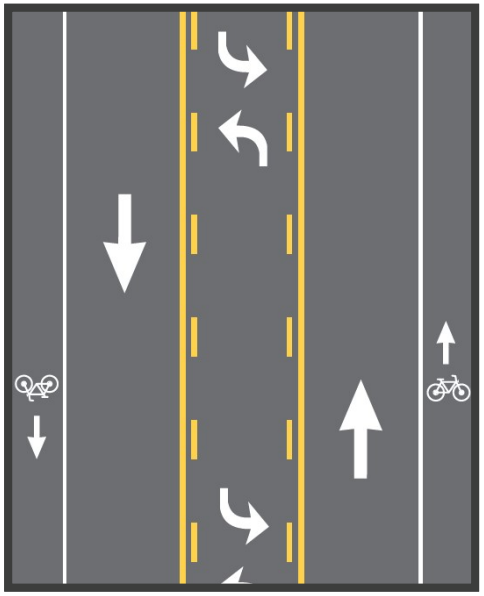
- Quantify and compare additional delays and queues

Turn Lane Reconfigurations and Signal Timing Changes

- By carefully analyzing and improving operations at intersections it may be possible to reduce the number of lanes mid-block on a street without increasing delay for motor vehicle traffic.

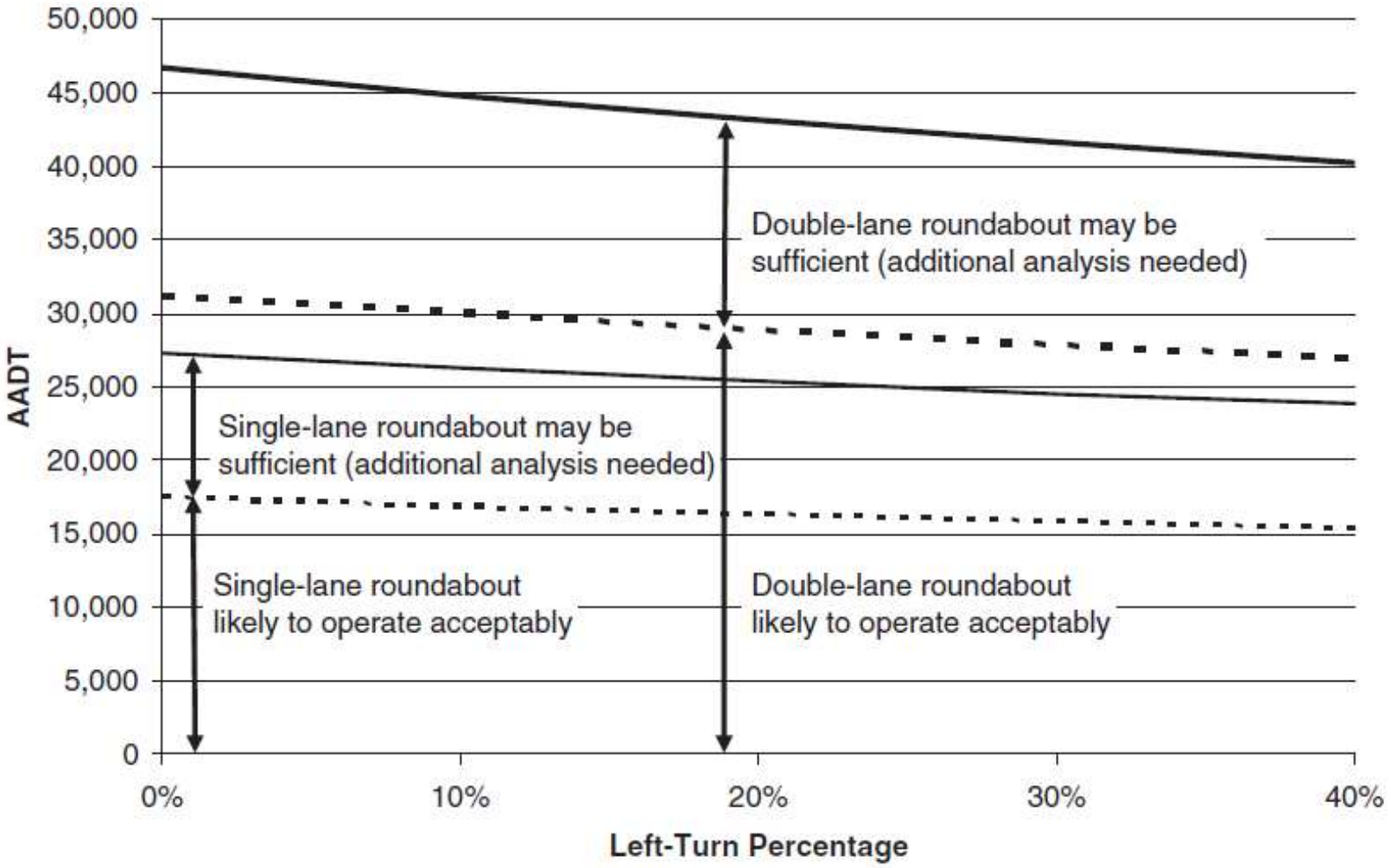


Repurposing and Roundabouts



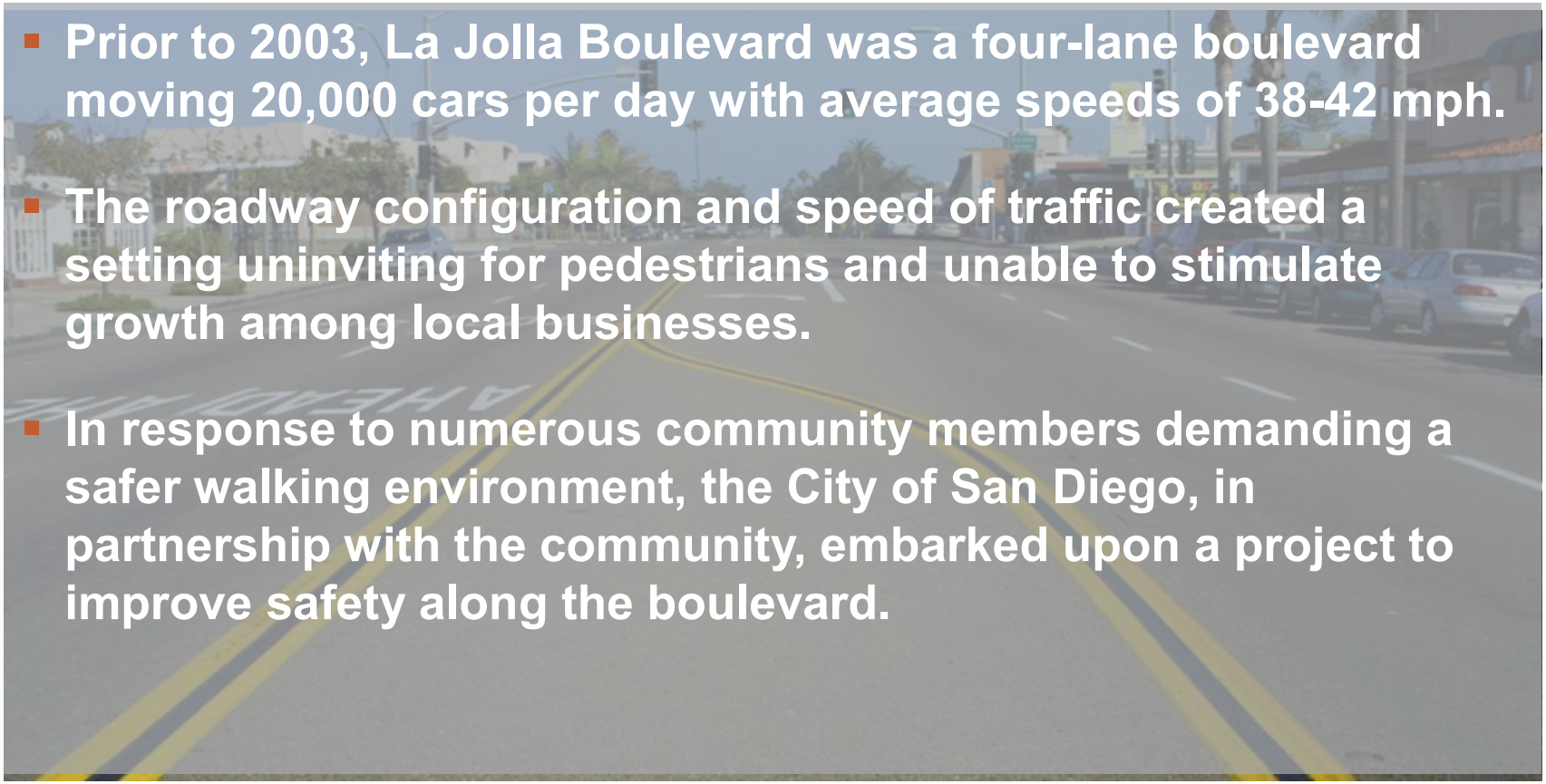
Comparable Volume Thresholds

Planning Level Volume Thresholds for Roundabouts



Source: NCHRP Report 672 Exhibit 3-12

LaJolla Blvd – Bird Rock Community (San Diego, CA)



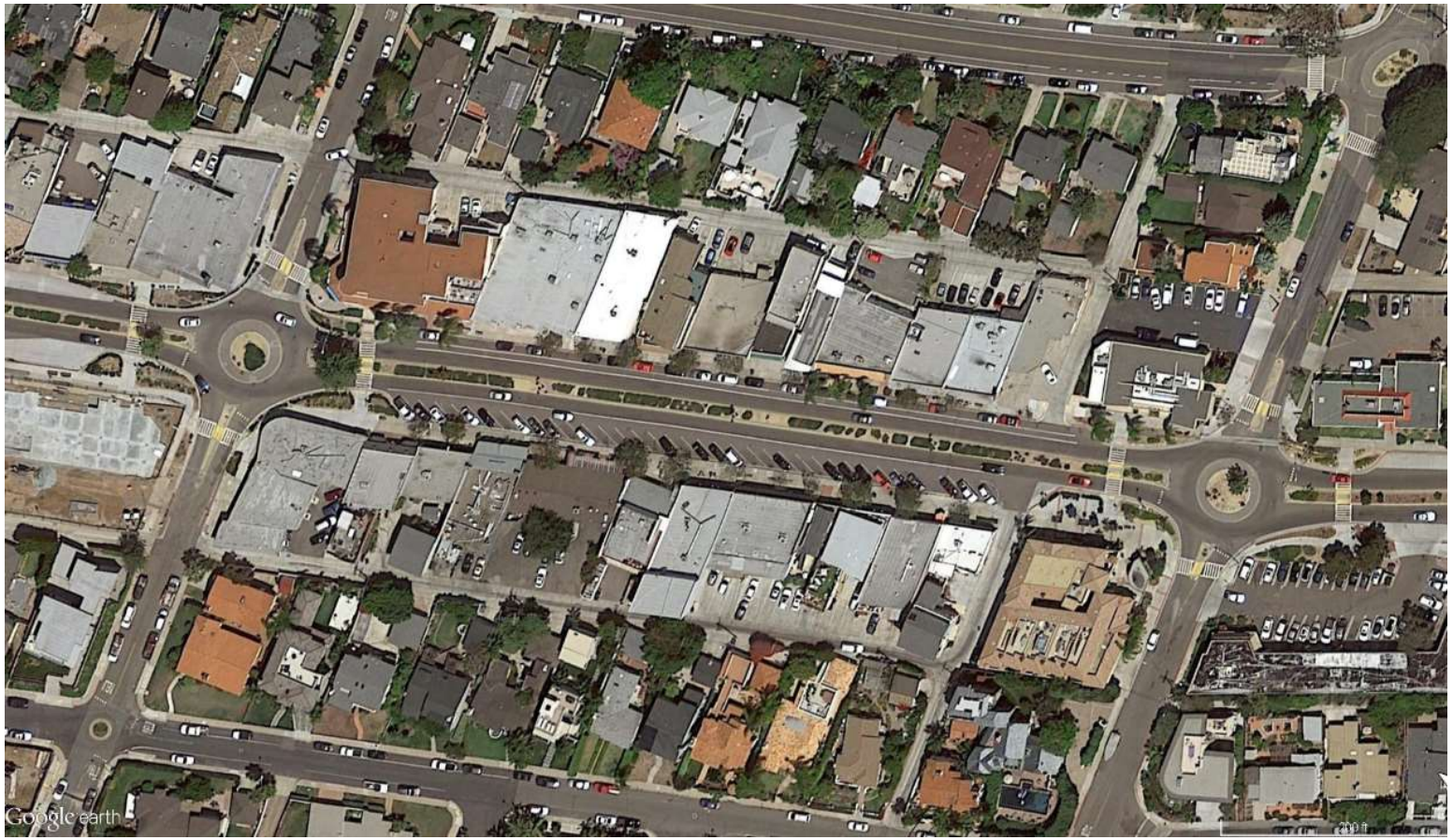
- Prior to 2003, La Jolla Boulevard was a four-lane boulevard moving 20,000 cars per day with average speeds of 38-42 mph.
- The roadway configuration and speed of traffic created a setting uninviting for pedestrians and unable to stimulate growth among local businesses.
- In response to numerous community members demanding a safer walking environment, the City of San Diego, in partnership with the community, embarked upon a project to improve safety along the boulevard.

Source: Arnold, M., Chui, G., and Lupo, D., P.E. “Roundabout Product Demonstration Showcase” Presentation on December 10, 2008, City of San Diego Engineering & Capital Projects Department

LaJolla Blvd – San Diego, CA

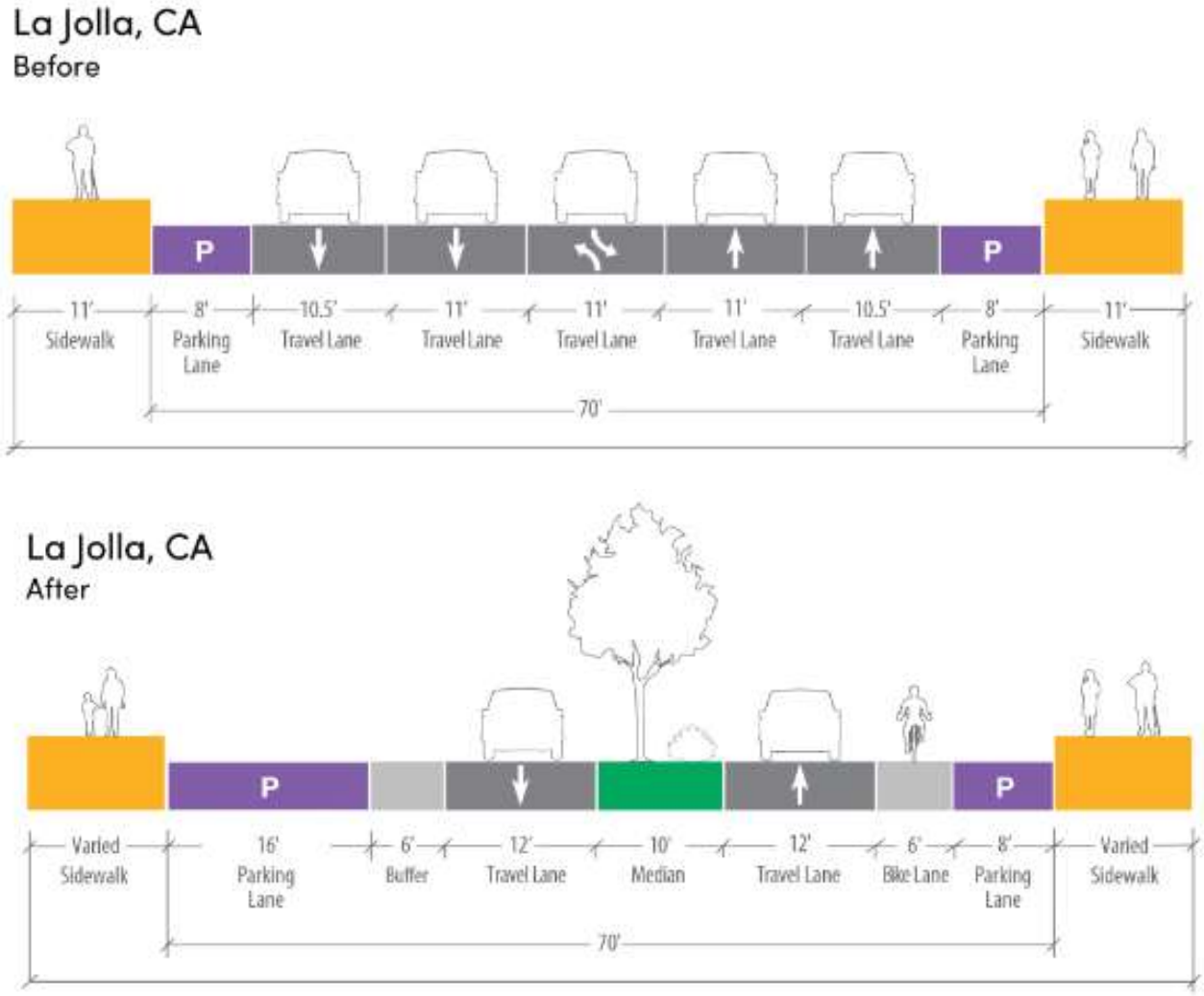
LaJolla Blvd – Bird Rock Community (San Diego, CA)

- Narrower travel lanes, five roundabouts, landscaped medians and angled parking have slowed traffic speeds, improved pedestrian safety, and also revitalized the businesses!!!

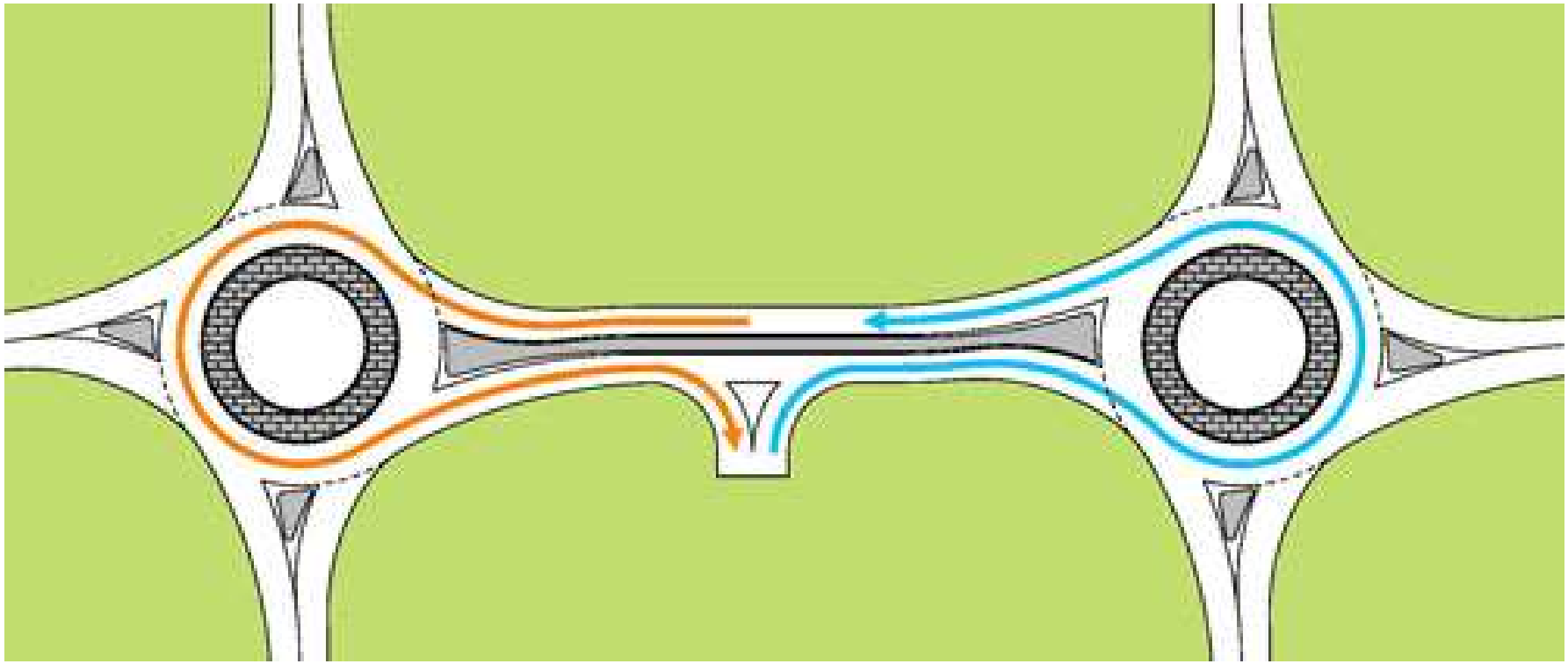


LaJolla Blvd – Photo Credit: Mark Doctor FHWA

LaJolla Boulevard Cross Section Before & After



Roundabouts and Access Management



BEFORE: Even with five turn lanes, this signalized intersection in downtown Asheville still functioned poorly and held back economic revitalization. Photo courtesy of the City of Asheville.

AFTER: This modern roundabout with eight connecting lanes in downtown Asheville, North Carolina, replaced a signalized intersection that had 18 connecting lanes. Photo courtesy of the City of Asheville.

Overland Park, KS – “Before”

Mini-Roundabouts

Considerations for Urban Corridor

- The operational impacts (such as significantly more queuing and delay) may be greater in a busy downtown setting due to heavy side street volumes and loss of left-turn capacity caused by the short block lengths

Photo Resource: Mark Doctor

Delivery Zones

Consider the current and future needs for delivery zones and loading areas. Removal or relocation of delivery zones may impact truck access to businesses. Where there is only one through lane per direction, trucks that stop for deliveries are likely to block auto traffic.

Photo Resource: Mark Doctor

On-street Parking

Consider:

- Impact on parking maneuvers
- Parking spot design (parallel vs diagonal)
- Interactions between bicyclist and parking vehicles

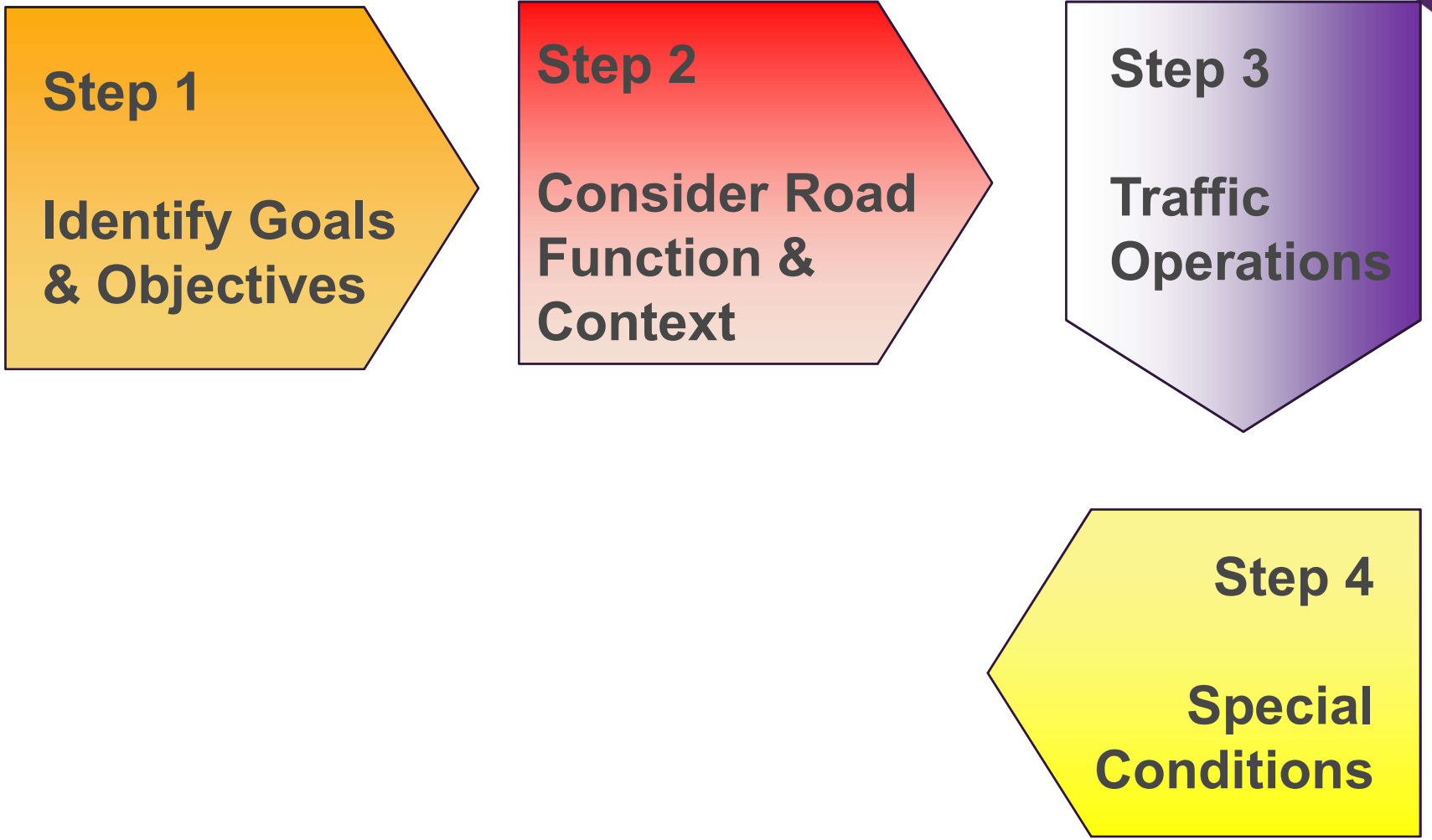
Photo Resource: Mark Doctor

Transit Considerations

- By going to a single-lane in each direction, frequent transit stops may cause additional delay
  - Reassess bus stop location and spacing
  - Consider bus pullouts

Photo Resource: Mark Doctor

Feasibility Worksheet Steps



Parallel Roadways

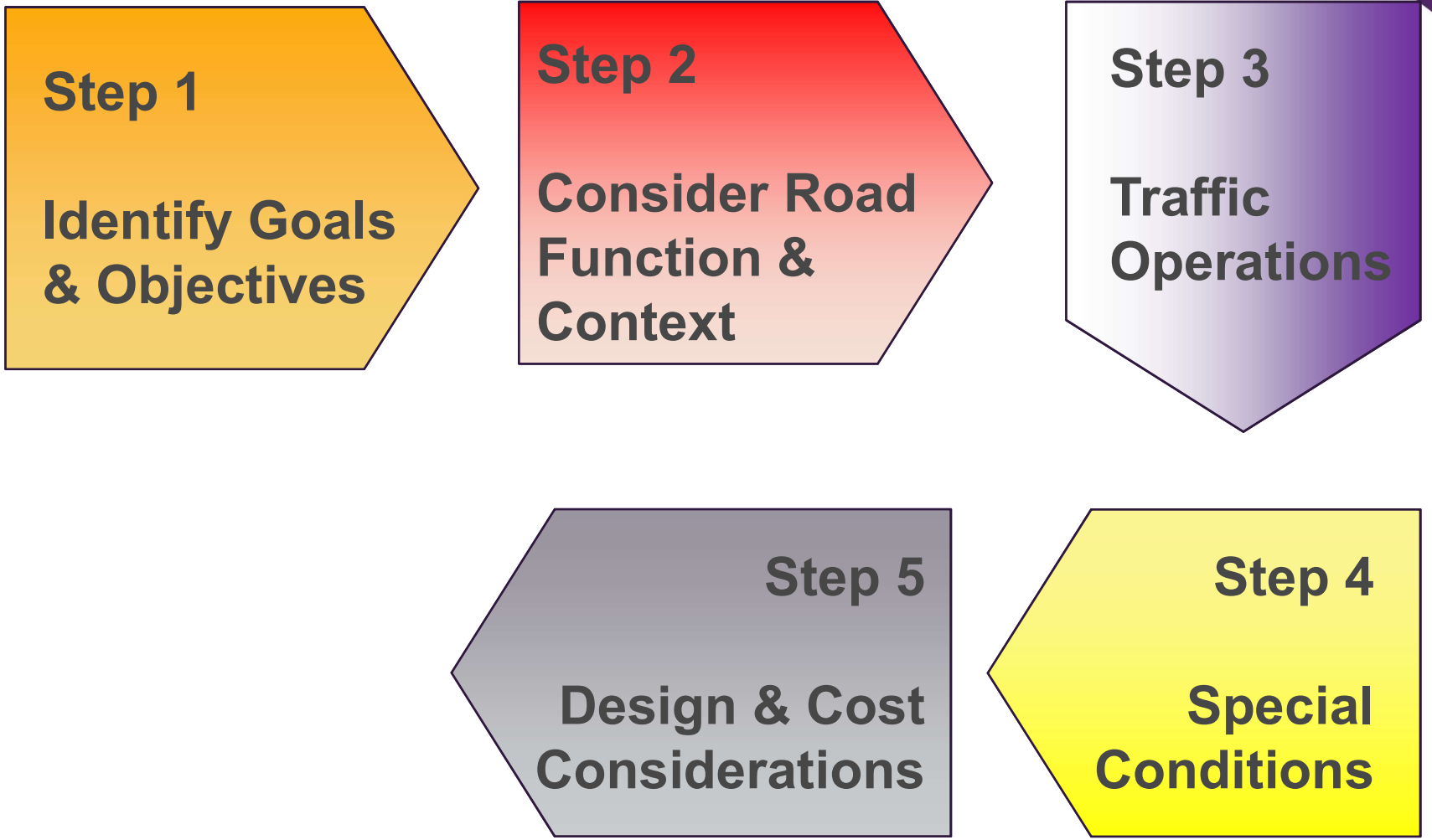
- Potential diversion of traffic to parallel routes. Considerations include:
  - Distance to parallel route
  - Amount of increased delay from Lane Reduction
- Can apply traffic calming on parallel routes to offset impact

Photo Resource: Jennifer Atkinson

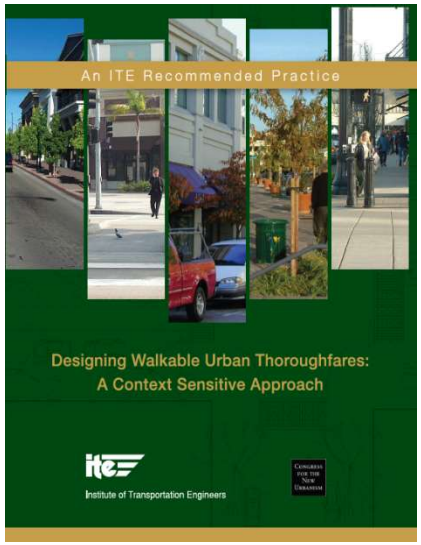
At-Grade Railroad Crossings

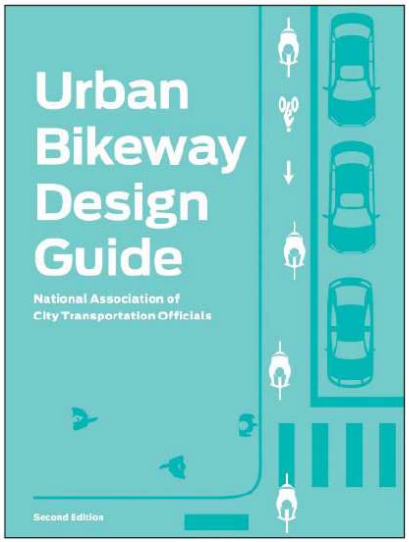
- May double the queue length at railroad crossings impacting other intersections
- May cause turning lane backup at parallel railroad crossings

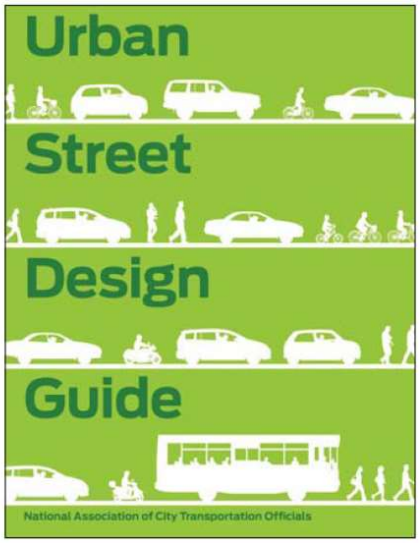
Feasibility Worksheet Steps

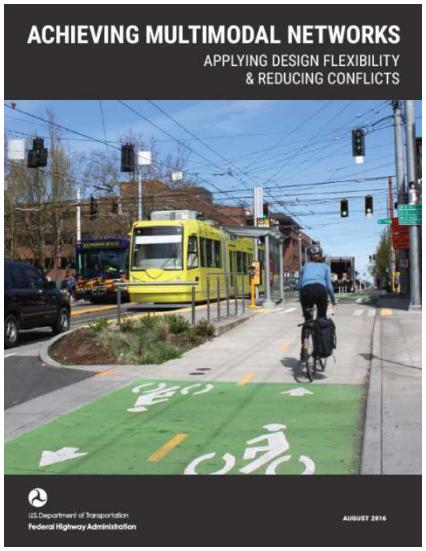


How?
Urban Street Design Resources







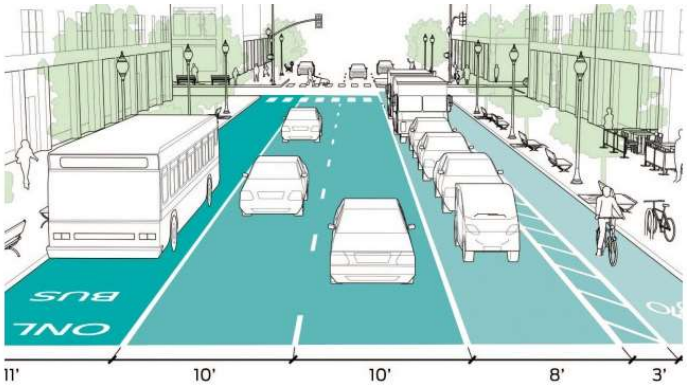


https://ecommerce.ite.org/IMIS/ItemDetail?iProductCode=RP-036A

https://nacto.org/publication/urban-street-design-guide/

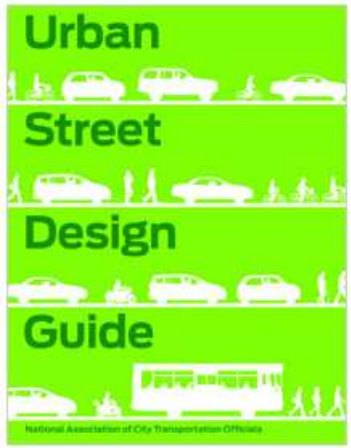
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_networks/

What do football and street design have in common?



The width allocated to lanes for motorists, buses, trucks, bikes, and parked cars is a sensitive and crucial aspect of street design. Lane widths should be considered within the assemblage of a given street delineating space to serve all needs, including travel lanes, safety islands, bike lanes, and sidewalks.

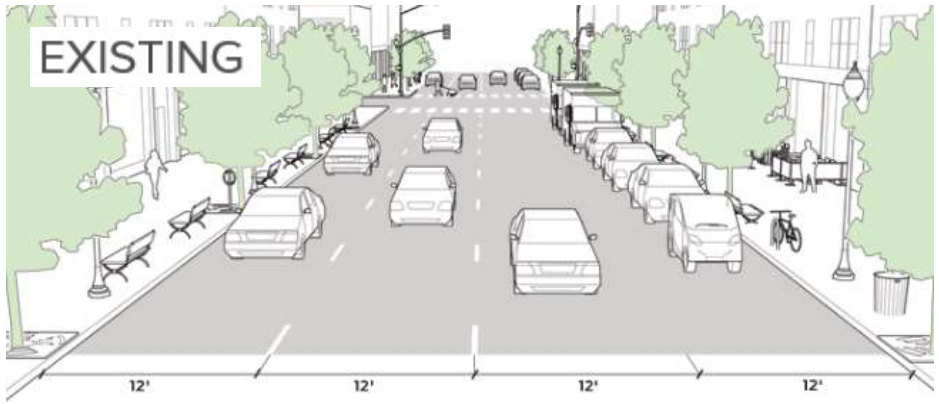
Each lane width discussion should be informed by an understanding of the goals for traffic calming as well as making adequate space for larger vehicles, such as trucks and buses.

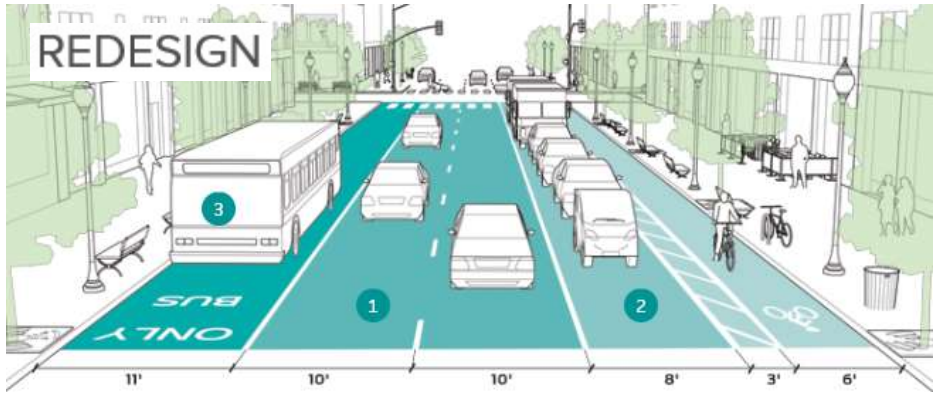


https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/

Lane Widths

Travel lane widths of 10 feet generally provide adequate safety in urban settings while discouraging speeding. Cities may choose to use 11-foot lanes on designated truck and bus routes (one 11-foot lane per direction) or adjacent to lanes in the opposing direction.

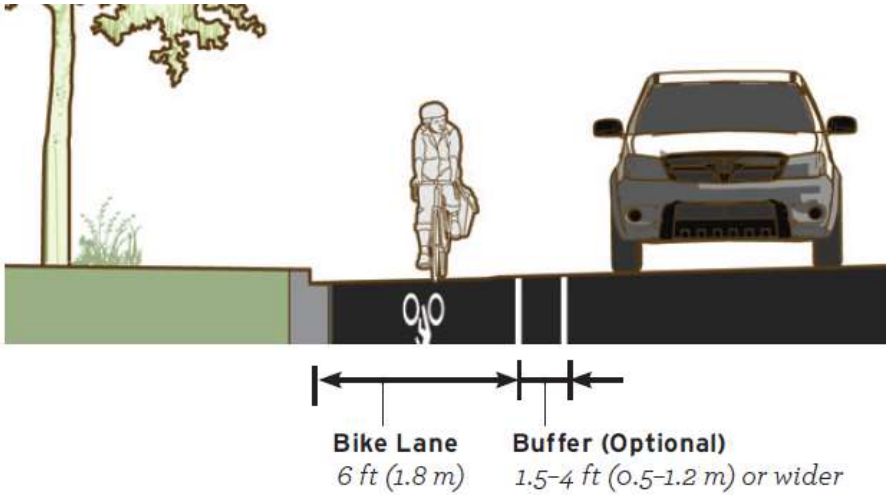


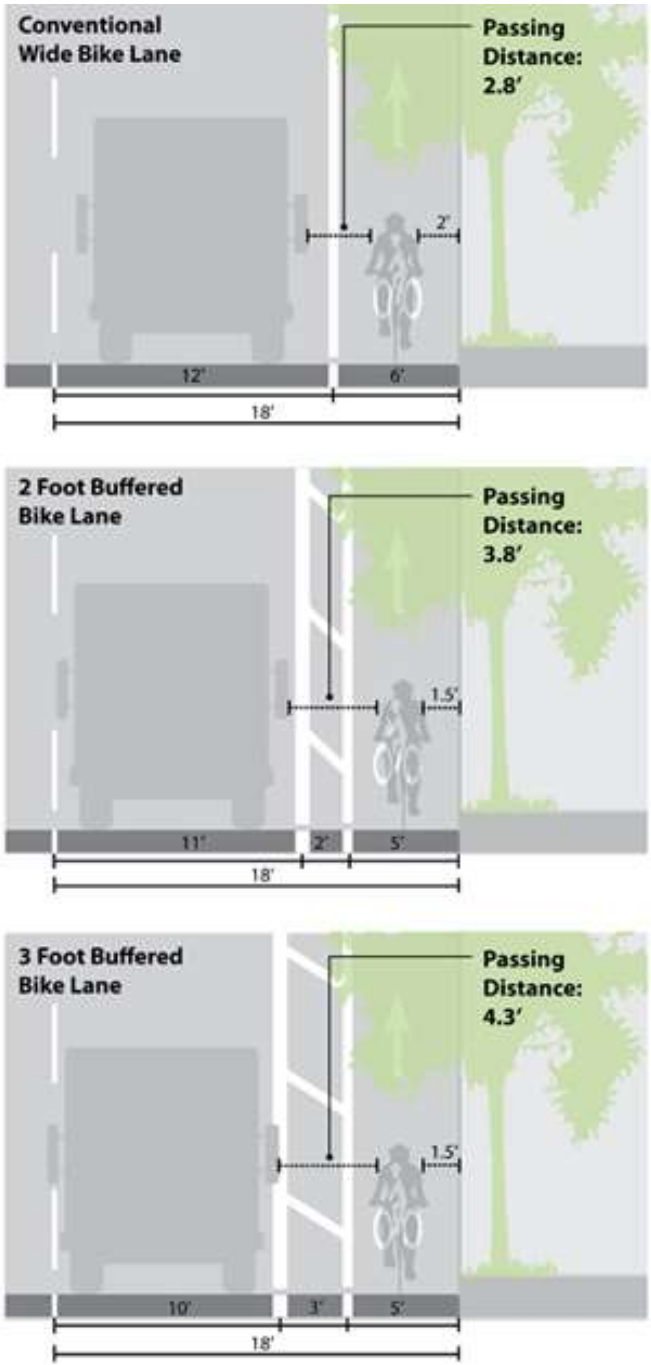


https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/

Conventional Bicycle Lane Widths

- Typical bike lane: 5-6 ft.
  - Min: 4 feet of rideable surface
- If space is ≥ 7ft. consider adding buffer



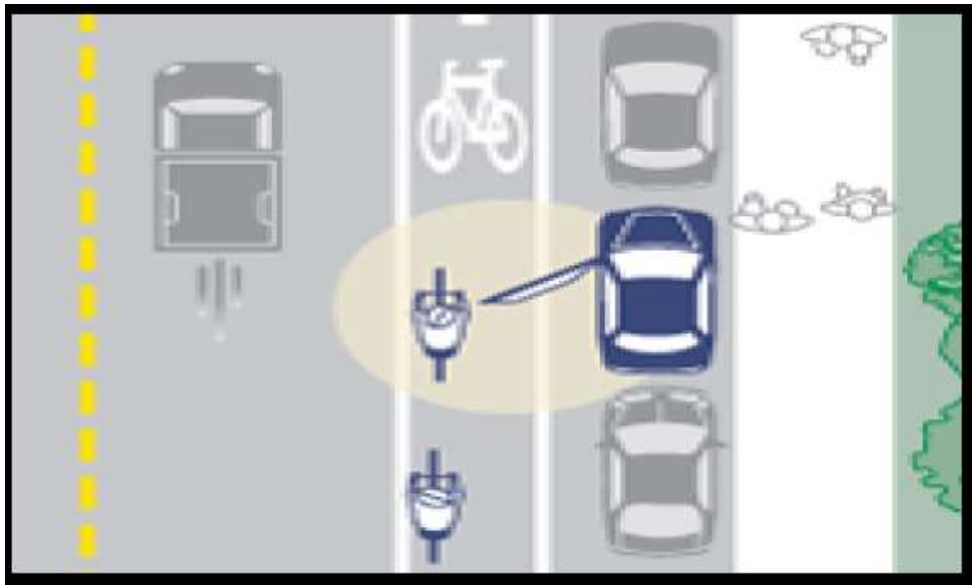


Buffered Bike Lanes

- Provides greater shy distance between motor vehicles and bicyclists without making the bike lane appear wide and possibly mistaken for a travel or parking lane
- Encourages bicyclists to ride outside of the door zone when buffer is between parked cars and bike lane

Painted Buffer Zones Adjacent to Bike Lane

Cyclists “Doored”

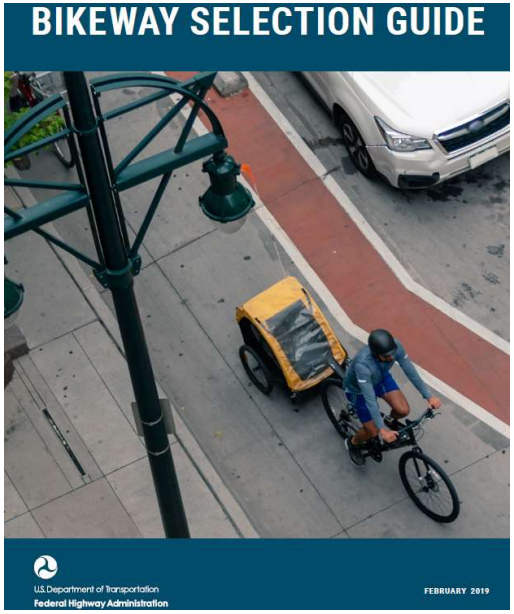


Separated Bike Lanes

Two-way separated Bike Lane

Seattle, WA

FHWA BIKEWAY SELECTION GUIDE



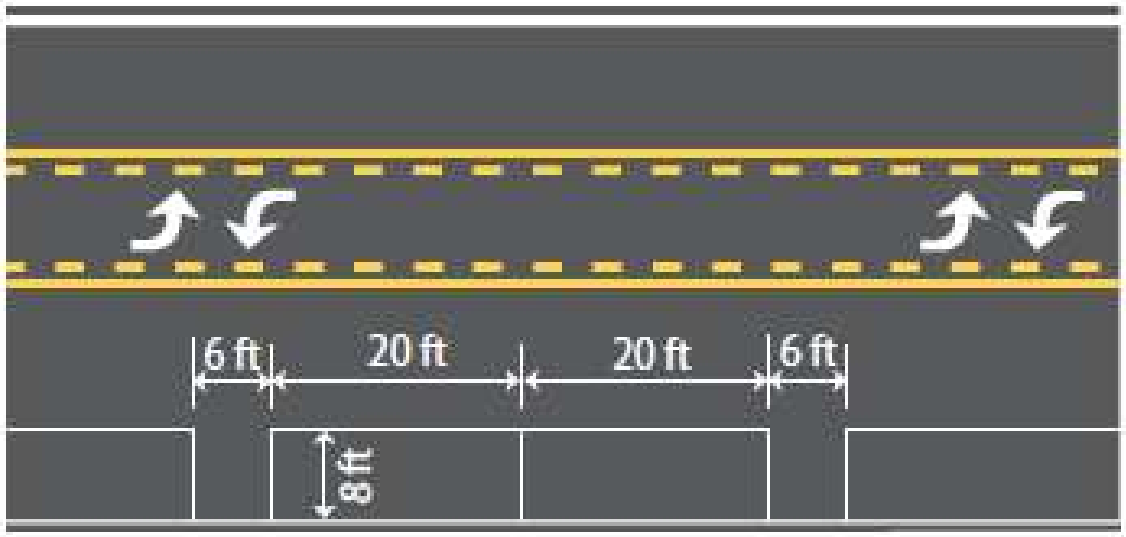
	Shared Lanes	Boulevards	Shoulders	Bike Lanes	One-Way Separated Bike Lanes with Mixing Zones	Separated Bike Lanes and Sidepaths with Protected Intersections
Functionality (Comfort) - Roads can be categorized by their function						
Lowest at higher vehicle speeds and volumes	✓	✓	✓	✓		
Highest at lower vehicle speeds and volumes	✓	✓	✓	✓		
Moderate to High due to separation from traffic and constrained entry point					✓	
High due to separation from traffic and constrained conflict point						✓
Homogeneity - Roads with vehicles of balanced speeds, directions, and masses are the safest						
Intersection approach exposure to potential motorist conflict is high	✓	✓	✓			
Turning conflict exposure correlates with vehicle speeds and volumes	✓		✓	✓	✓	✓
Turning conflict exposure generally lower due to lower vehicle speeds and volumes		✓				
Constrained entry point reduces approach exposure if visibility is good					✓	
Constrained conflict point eliminates approach exposure, and constrains conflicts to a single point						✓

https://safety.fhwa.dot.gov/ped_bike/tools_solve/docs/fhwasa18077.pdf

On-Street Parking

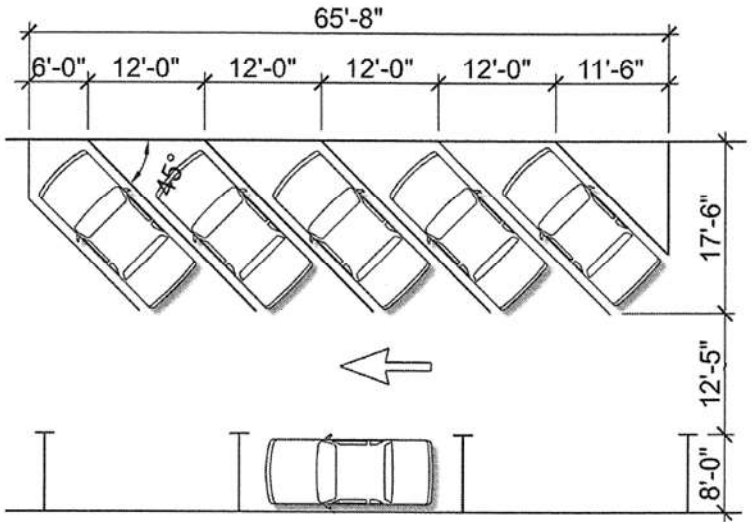
- Parking lane widths of 8-10 feet generally recommended
- Wider parking lanes (up to 15 feet) may be appropriate for loading zones or areas with common short duration “double parking” for quick deliveries

Figure showing “Paired” Parallel Parking



Angled Parking

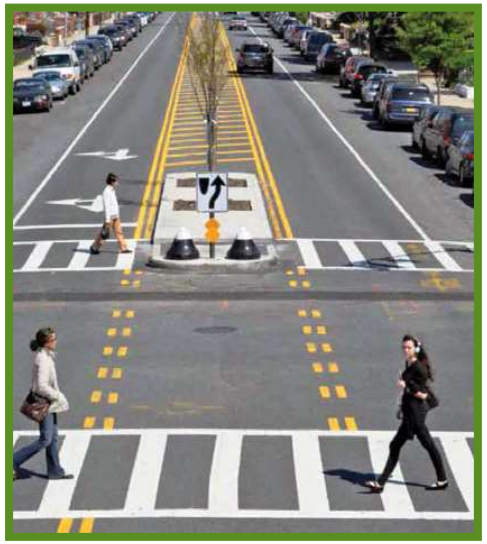
- Provides 60-75% more spaces than parallel parking
- Angled parking depth (measured perpendicular to the street) is dependent on the stall angle (17.5 feet for 45°, 19.0 feet for 60°, 19.5 feet for 75°)
- “Back-in” has advantages over “Head-in”



Source: ITE Traffic Engineering Handbook

Median

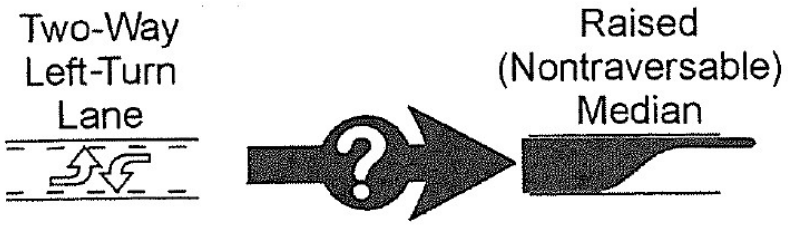
- Can be raised, flush (marked), or TWLTL



Medians & TWLTLs

TWLTLs may be appropriate for:

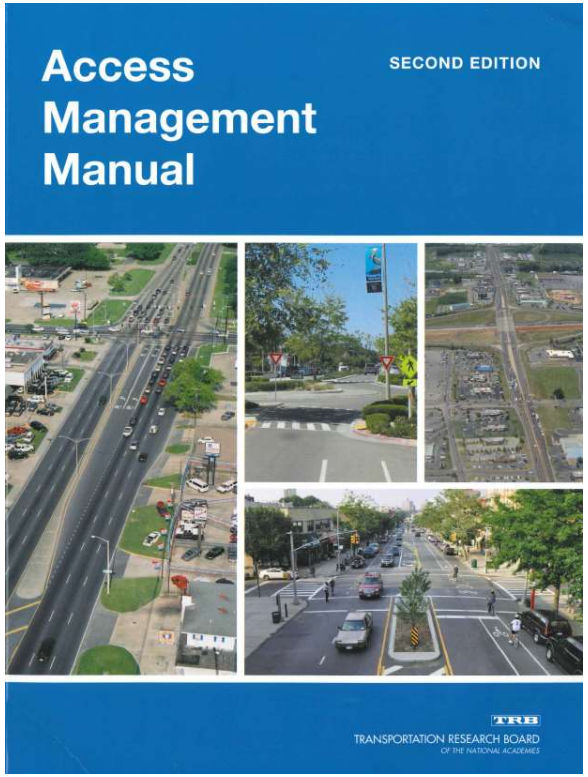
- ADT < 24,000 vpd
- Direct access to small abutting properties with ingress volumes < 100 vph



A non-traversable median is desirable for:

- Multilane roadways with ADT > 24,000 vpd
- Areas desirable to limit left turns to improve safety

TRB Access Management Manual



Pedestrian Refuge Islands

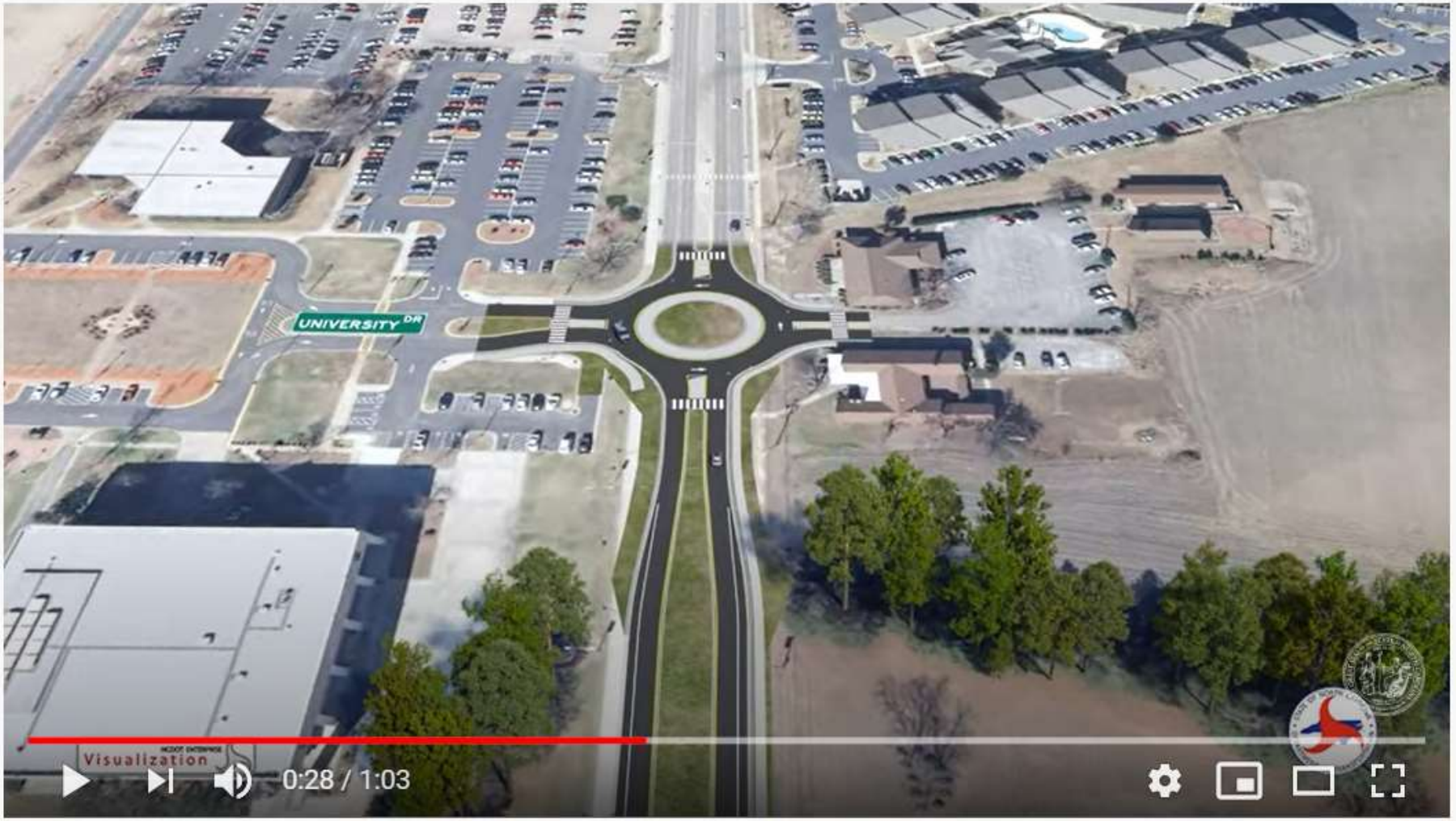
- Can use the TWLTL space at mid-block locations or where turns are prohibited
  - Minimum 6 ft. wide / Preferred 8 – 10 ft. wide
  - Include detectable warning tiles

Case Study – Pembroke, NC

- N. Odom Street Road Diet - reconstructed 5-lane section to one lane in each direction and bicycle lanes
- Major entrance for the UNC Pembroke campus
- Constructed two roundabouts, sidewalks, a landscaped median with mid-block crosswalks
- Vehicles from the side streets wanting to go left make a U-turn at a roundabout

North Odom Street/Prospect Road in Robeson County has been undergone a $5 million reconstruction to improve safety.

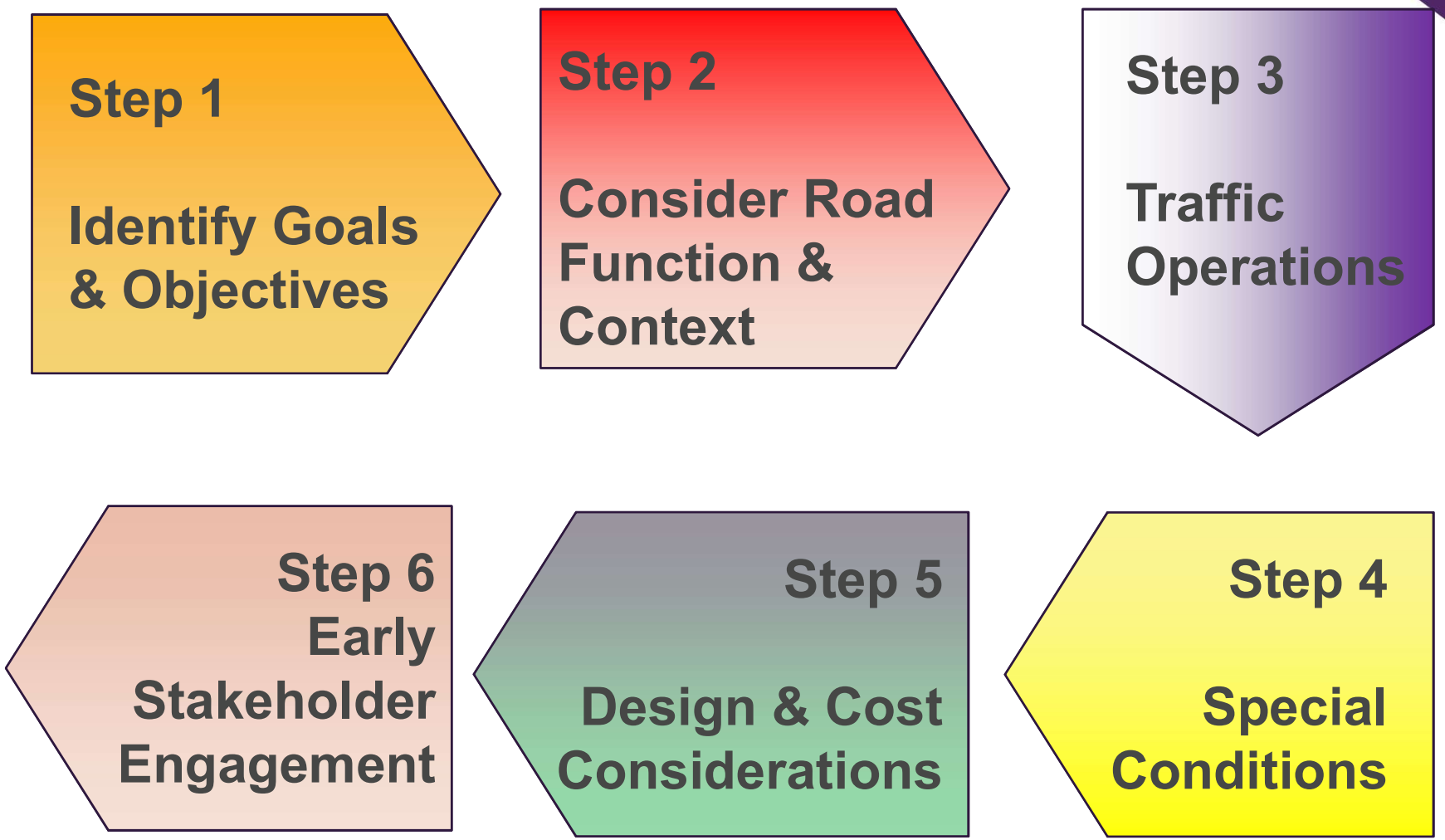
https://www.ncdot.gov/news/press-releases/Pages/2019/2019-10-15-robeson-county-road-reconstructed.aspx



North Odom Street/Prospect Road Visualization

https://www.youtube.com/watch?v=kzT8I_RKOHA&feature=youtu.be

Feasibility Worksheet Steps



Public Relations Challenge
Public Involvement Opportunity

- Are there any known controversies associated with this area?
- Have endorsements or documented project support been made by appropriate city, county, and/or regional bodies (e.g., a commission or board resolution)?
- Have any concerns or supportive comments been voiced at public meetings from local businesses, residents and other stakeholders?

Everyone Has Their Reasons

Top Eight Reasons to go on a Road Diet

1. They are shown to reduce crashes by 19-47%.
2. They are shown to decrease speed and calm traffic.
3. They are shown to reduce rear-end and left-turn crashes with a dedicated left-turn lane.
4. They make it easier for pedestrians to cross the street with pedestrian refuge islands and/or wider sidewalks.
5. They provide an opportunity to install bicycle facilities.
6. They can create space for on-street parking or transit stops.
7. They can improve livability with a more community-focused "complete streets" environment.
8. They are budget-friendly, especially when planned with simple overlay projects or combined with other road projects.

https://www.roadsbridges.com

10 Reasons to Oppose Road Diets

You just learned that your city intends to install a road diet on an arterial route you take every day. You are not alone—this now happens regularly all over the country. Here are 10 excellent arguments to combat road diets in your city council or county commission.

1. Road diets can cause more accidents. When traffic does not flow, more accidents occur. Vulnerable road users sometimes have the mistaken belief that the road is safer. In reality, all users of the road need to remain vigilant and responsible. There are better and less expensive ways to make a street safer: better crosswalks, improved stoplights, & bikeways placed on non-arterial streets.

2. Emergency vehicles such as large fire ladder trucks cannot always navigate corners on streets that have been reduced which could violate fire codes.

3. Blocked egress during mass evacuations can cause injury and death.

4. Loss of parking can cause business districts to be decimated with job losses and business closures.

5. Gridlocked boulevards will divert traffic to residential streets which are not intended to handle that load.

6. Due to the increased gridlock, there is more individual vehicle wear and tear, greater overall street noise, and increased vehicle emissions.

7. Many times, a road diet may cause violations of the Americans with Disability Act due to difficult curb cuts and the loss of handicapped parking.

8. Road diets can present already underfunded local and county street departments with more street elements to maintain, stretching their budgets and liability exposure even further.

9. Road diets can create animosity between neighbors in the area.

10. Residents and business owners can have increased distrust of government if the process is forced and not transparent.

https://www.motorists.org

Are We Really Just Stewpid?

Completed in 2011, the road diet took High and Hanover streets in the borough from four lanes to two, and added bicycle and turning lanes. The changes were meant to calm traffic, reduce noise, enhance the small-town feel of the borough and improve parking.

Willie Aug 16, 2014 9:47am

My only real issue with the road diet is the bike lanes... bikes and cars don't mix.. sorry bikers you shouldn't be on High or Hanover Street too dangerous and without the bike lanes there would be more room for autos and truck to navigate the parked car doors, walkers and other distractions.. the Borough is lucky a biker hasn't die yet ..... sorry bikers go to the side roads..

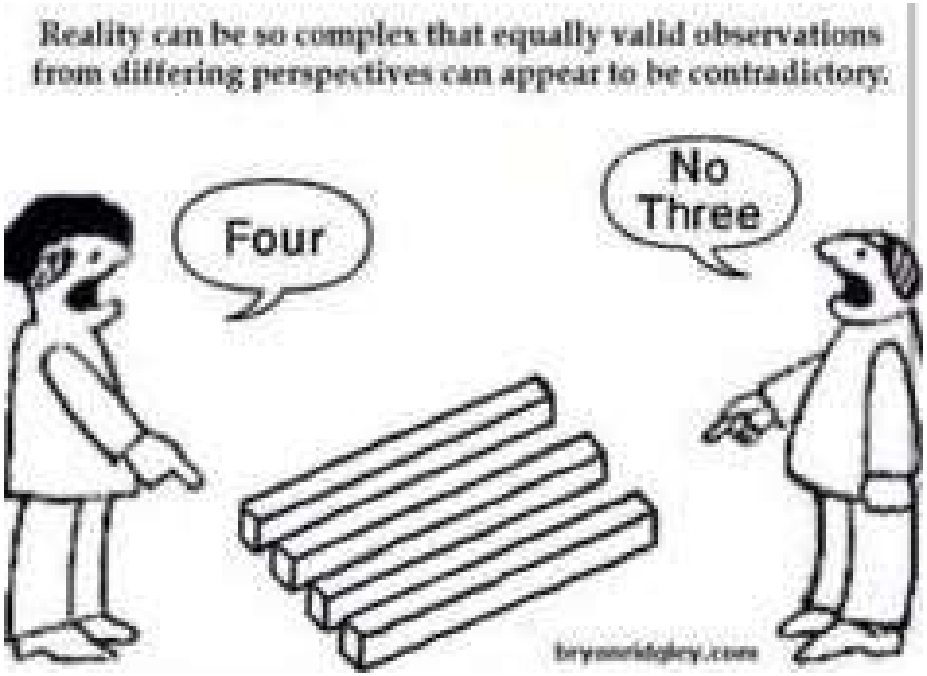
ccpc Aug 16, 2014 3:07pm

Lets conduct another $100,000 dollar study to find out why the other $100,000 dollar study could not foresee the problems that a person with just a little bit of common sense could.

sik of stewpid peepole Aug 17, 2014 11:34am

My only issue with the Road Diet is the Road Diet!

Perception Is Reality



How to Get It Right

- **Engage the public**

Since road diets are a new concept in many communities, it's important to involve the public as soon as possible during the discussions and planning. Doing so can minimize any anxiety about the unknowns and give residents ownership of the road diet goals.

- **Embrace a public process and build support**

Develop an education and awareness campaign prior to implementation, and reach out broadly to community members, elected officials and municipal leaders. Government officials may need to see public support before acting.

Toward that end, advocates can share this fact sheet, talk to neighbors, build community support and then meet with decision makers, the media, experts and others to discuss the benefits of road diets. Agency staff can engage the public by hosting workshops to build public acceptance and understanding.

How to Get It Right

STAKEHOLDER INVOLVEMENT, EDUCATION, AND BUY-IN

GCMPC uses an educational approach to gain public support for Road Diets. Selecting appropriate Road Diet locations within the county based on engineering studies is the first step. The GCMPC then approaches individual city agencies about the potential Road Diet corridor and educates the stakeholders on the benefits. This collaboration begins early in the planning process and continues through the Road Diet installation. Working together with these stakeholders gives a sense of project awareness and buy-in to all involved, and it helps to overcome obstacles that arise along the way, leading to smoother implementation.

5th Ave - City of Flint

Public Outreach Strategies

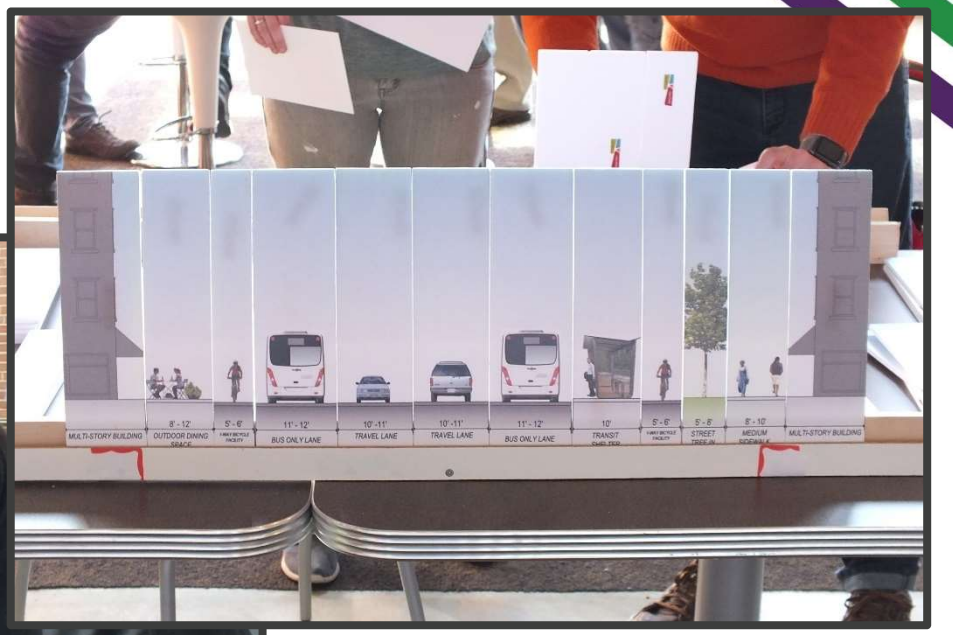
- Public Meeting/Open House
  - Informational
- Public Workshop/Design Charette
  - Engaging
- Virtual Alternatives
  - Flexible, Scalable

Public Workshops

- Helps define community vision
- Conveys a sense of ownership

Public Workshops

Street Builder



ROAD DIET

Public Workshops

December Design Day

Understand the feasibility study

Learn more about street and intersection design options (road diets, roundabouts)

Set up a demonstration project outside

Public Workshops

The road diet and traffic

How does the corridor really work for you?

Worst-case estimated changes, compared to today's commute times

	Road diet with today's traffic	Road diet with future traffic
Morning peak-hour travel	*25 seconds less*	1 min, 5 sec
Afternoon peak-hour travel	45 seconds	1 min, 50 sec

Is this a worthwhile tradeoff for a safer, more attractive street?

Public Education

Case Studies

Reno, Nevada

EDUCATING THE PUBLIC ON ROAD DIETS

OBJECTIVE
- Educate the public about the benefits of Road Diets

FEATURES
- Information provided on how to interact with new lane markings for drivers and bicyclists
- Answers to frequently asked questions

RESULTS
- Increased public's knowledge of Road Diet's benefits
- Implementation for successful Road Diet

BACKGROUND

The Regional Transportation Commission (RTC) of Washoe County has implemented many Road Diets within the City of Reno to allow for the addition of bicycle lanes. These projects were created as part of the Complete Street initiative to stimulate economic development and improve citizens' quality of life. The RTC has been proactive in educating the public during the entire process of implementing Road Diets. Once projects are complete, the RTC also publicizes the annualized crash rates1 for the road segments which have undergone the Road Diet treatment. This increases the public's understanding of the safety benefits.

PUBLIC OUTREACH

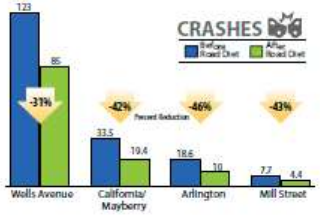
Prior to their Road Diet implementations, the RTC developed a two-page flyer that explains the basic concept of a Road Diet, discusses its associated benefits, and describes how to interact with the new lane markings.

The simple document describes Road Diets in terms that citizens understand and addresses issues the public cares about such as improving traffic flow, reducing crashes, and increasing the number of parking spaces.

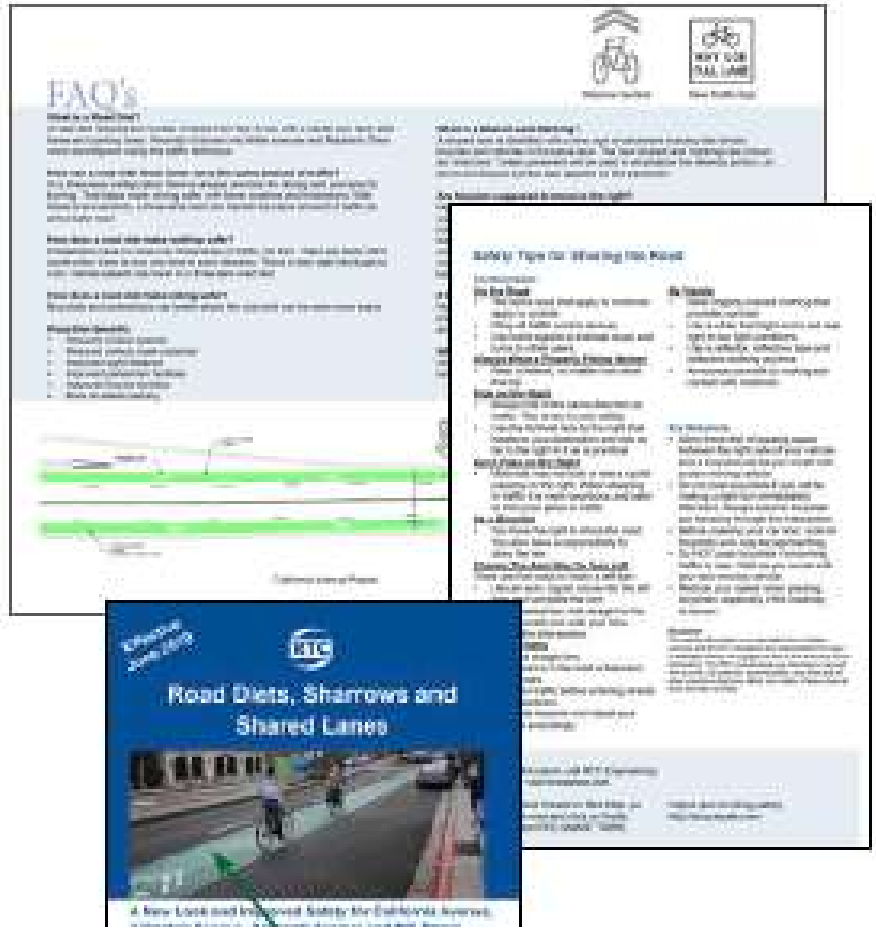
The flyer provides answers to the most frequently asked questions:

- What is a Road Diet?
- How can a road with fewer lanes carry the same amount of traffic?
- How does a Road Diet make walking safer?
- How does a Road Diet making bicycling safer?
- Road Diet benefits
- What is a shared lane marking?
- Are bicycles supposed to move to the right?
- If I see these markings in a lane, is the lane only for bicycles?

The RTC also publicizes the annualized crash rates[1] for the road segments which have undergone the Road Diet treatment. This increases the public's understanding of the safety benefits.



1 These crash rates are based on before-and-after studies of four Washoe County Road Diet locations. The numbers of crashes have been annualized to show a direct comparison between the locations. The percentages are intended for informational purposes only.



ROAD DIET

Public Website

An Avenue For Everyone

A Safer North Avenue, pilot and testing coming our way in 2016

Home Pilot Case Studies FAQs Resources North Stories Get Involved

Help create an avenue for everyone

The North Avenue Corridor Pilot aims to create a safer North Avenue in order to

- Support the needs of kids, parents, adults, and grandparents, business owners, shoppers, visitors, and workers.
- Be safe and accessible for people walking, driving, riding busses, and biking to and from work, shopping, dining, sports, and school.
- Be designed to reduce crashes, reduce speeding, reduce stress, increase comfort.

Safety updates to include:

4>3 lane conversion for safer conditions for people driving.

Center turn lanes to improve access for people to homes, businesses, schools, churches, and civic venues.

More cross-walks to make it safer for pedestrians.

Dedicated bike lanes for people biking.

ROAD

Website and Video

WHAT ARE THE BENEFITS OF A 4- TO 3-LANE CONVERSION?

- Shown to reduce crashes by about half.
- Decreases left-turn and rear-end crashes because of the dedicated center turn lane.
- Opportunity to provide enhancements such as parking or bike lanes.
- Improves walkability - fewer lanes for pedestrians to cross, and traffic is located farther from the sidewalk.
- Easier access to homes, schools, and businesses.
- Regulates speeds and calms traffic. Speeds are more consistent with just one lane in each direction.

https://iowadot.gov/traffic/4-to-3-Lane-Conversion/3-Lane-Roads

ROAD DIET

Virtual Public Involvement

- Mobile Applications
- Project Visualizations
- Do-It-Yourself Videos
- Virtual Town Halls

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/virtual_public_involvement.cfm

Mobile Apps

- Suitable for larger or on-going efforts
- Reduces barriers to engagement as individuals may participate from anywhere
- Users can submit comments, photos as they experience transportation system
- Built in location technology allows for easy geotagging of comments

VPI in Practice
The Delaware Department of Transportation (DelDOT) developed a mobile app for a range of activities, from sharing information about project planning and alerting stakeholders to upcoming public meetings to giving the public a way to report maintenance issues.
Image courtesy of Delaware Department of Transportation (DelDOT)

Project Visualizations

- Illustrate and visualize proposed projects
- May include still or video renderings, 3D visualizations, virtual and augmented reality

VPI in Practice
The Visual Engineering Resource Group at Washington State DOT develops visualizations to support the department's project development and NEPA processes. In this example, the team created a photo simulation showing local terrain, existing buildings, and a proposed roundabout on SR150.
Image courtesy Washington State DOT Visual Engineering Resource Group

Do-It-Yourself Videos

- Brief videos to inform the public or gather input
- Low-budget production – often self- produced on mobile phones
- Effectively communicate content to diverse audiences
- Can incorporate visualizations or other digital content about proposed projects

VPI in Practice

Utah Department of Transportation regularly creates short videos using smartphones and easy-to-use digital cameras. UDOT uploads these videos to the web then shares them on social media. The videos are short, low-cost, and give stakeholders an opportunity to hear directly from agency staff about issues like project planning, construction activites, and upcoming public events and meetings.

Image courtesy Utah Department of Transportation (UDOT)

ROAD DIET

Virtual Town Halls

- Allow stakeholders to participate online or by phone
- Allow stakeholders to engage in live polling and other dynamic information sharing at a live public meeting
- Accessible to stakeholders unable to participate in person

VPI in Practice

The San Francisco Municipal Transportation Agency used a virtual town hall meeting to discuss its FY 2019 and 2020 budget. The online meeting helped to improve participation and elicit useful project feedback.

Image courtesy of San Francisco Municipal Transit Agency

SFMTA Online Budget Townhall

Challenges to Engagement

- Not all strategies equally effective in reaching and engaging the publics
- A combination of strategies – traditional and innovative are needed

Tips for a Successful Lane Repurpose Project

- *Early and continuous stakeholder engagement*
- Assess suitability and feasibility
- *Early and continuous stakeholder engagement*
- Preliminary Design
- ***Early and continuous stakeholder engagement***
- Final Design

ROAD DIET

When You Get It Right

"We were critical of the Des Moines City Council for its decision to approve the restriping of Ingersoll Avenue to change it from four lanes to three lanes…On all accounts, we were wrong. Our concerns proved to be unwarranted."

Cityview, Central Iowa's Independent Weekly[1]

Des Moines, Iowa

Evaluate Results

ROAD DIET

Safety | Livability | Low Cost

Road Diet Evaluation Metrics

A Road Diet repositions pavement lines in order to improve safety for all users while adding space for other travel modes.

Data can be a powerful tool for telling a story. Evaluating performance both before and after implementing a Road Diet is key to an agency successfully implementing its next Road Diet project. Data helps agencies choose the most appropriate projects to meet their needs, supports design decisions, helps garner public support, and provides a building block for future implementations.

Agencies can collect a multitude of data, and practitioners may be thinking,

Where should I start?

How much level of effort is this going to take?

Do I need to collect everything?

Source: City of Charlotte, NC

Road Diet on East Boulevard, Charlotte, NC

To begin, an agency should define the purpose of and need for the potential Road Diet project. This starts with understanding who the road users are (i.e., pedestrians, business owners, freight industry, bicyclists, motorists, emergency vehicles, elderly, students, etc.), the nature of the surrounding community, and the current and future purpose of the roadway. The overarching goals for a particular project can provide insight into the types of data that are most useful.

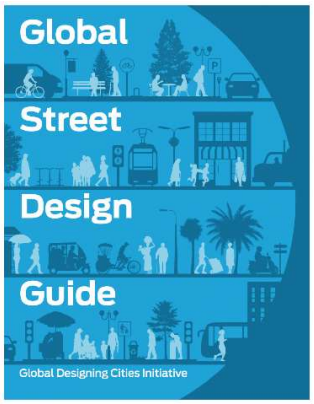
Agencies should also consider potential public concerns about the Road Diet project, such as traffic diversion, congestion or delays, negative business effects, or loss of parking. Understanding the project's purpose and need as well as the desires and concerns of the public are the foundation for defining evaluation metrics, executing a Road Diet data collection plan, and building a successful Road Diet program.

Evaluate Results

Example Evaluation Metrics

Operational	Safety	Livability/Economic Development
Daily traffic counts	Travel speeds	Transit ridership
Peak hour traffic counts	Percent of drivers over the speed limit	Availability of on-street parking
Turning movement traffic counts	Percent of top-end speeders (Greater than 10 mph over speed limit)	Overall public satisfaction
Intersection queue lengths (main street and side street)	Crash frequency, type, severity, and rate	Property values
Travel times (vehicles)	Perceived level of safety	Resident/public feedback
Travel time (transit)		Business feedback/sales records
Adjacent street traffic counts and speeds		Number of new businesses/ residences
Bicycle counts		
Pedestrian counts		

Measuring Success Broadly



The Global Street Design Guide is supporting practitioners to redefine the role of streets in cities around the world. Created with the input of experts from 72 cities in 42 countries, it offers technical details to inform street design that prioritizes pedestrians, cyclists, and transit riders.

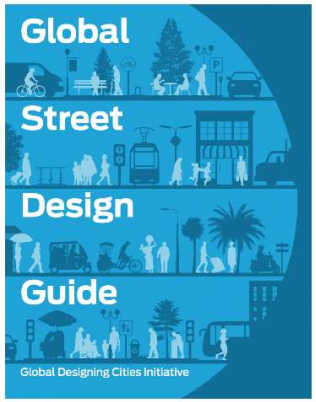
Measuring and Evaluating Streets

For decades, streets have been evaluated based on the movement of vehicles and the safety of drivers, but the true mobility function of a street can only be measured when the safety and movement of all users are considered.

Measuring the success of each street project requires a multidisciplinary and multi-scalar approach and methodology so that the many benefits of street projects may be captured.

https://globaldesigningcities.org/publication/global-street-design-guide/

Defining Success Over Time



Includes tables to identify relevant metrics to evaluate projects for goals on:

- Pedestrian Facilities
- Bicycle Facilities
- Transit Facilities
- Motorized Vehicle Facilities
- Freight Services
- City Services
- Business/Commercial Services

To understand the success of a project, measure and evaluate changes in use, behavioral changes, user comfort and satisfaction, and functional shifts.

Questions & Webinar Evaluation

ROAD DIET